



**VersaBlue®
Adhesive Melters
Type VB C
with
Siemens Controller**

Manual P/N 7135049A
– English –

Issued 02/07





Order number

P/N = Order number for Nordson products

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Europe

Country	Phone	Fax
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Austria		43-1-707 5521	43-1-707 5517
Belgium		31-13-511 8700	31-13-511 3995
Czech Republic		4205-4159 2411	4205-4124 4971
Denmark	<i>Hot Melt</i>	45-43-66 0123	45-43-64 1101
	<i>Finishing</i>	45-43-66 1133	45-43-66 1123
Finland		358-9-530 8080	358-9-530 80850
France		33-1-6412 1400	33-1-6412 1401
Germany	<i>Erkrath</i>	49-211-92050	49-211-254 658
	<i>Lüneburg</i>	49-4131-8940	49-4131-894 149
	<i>Nordson UV</i>	49-211-9205528	49-211-9252148
Italy		39-02-904 691	39-02-9078 2485
Netherlands		31-13-511 8700	31-13-511 3995
Norway	<i>Hot Melt</i>	47-23 03 6160	47-23 68 3636
	<i>Finishing</i>	47-22-65 6100	47-22-65 8858
Poland		48-22-836 4495	48-22-836 7042
Portugal		351-22-961 9400	351-22-961 9409
Russia		7-812-11 86 263	7-812-11 86 263
Slovak Republic		4205-4159 2411	4205-4124 4971
Spain		34-96-313 2090	34-96-313 2244
Sweden		46-40-680 1700	46-40-932 882
Switzerland		41-61-411 3838	41-61-411 3818
United Kingdom	<i>Hot Melt</i>	44-1844-26 4500	44-1844-21 5358
	<i>Finishing</i>	44-161-495 4200	44-161-428 6716
	<i>Nordson UV</i>	44-1753-558 000	44-1753-558 100

Distributors in Eastern & Southern Europe

DED, Germany	49-211-92050	49-211-254 658
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Outside Europe / Hors d'Europe / Fuera de Europa

- For your nearest Nordson office outside Europe, contact the Nordson offices below for detailed information.
- Pour toutes informations sur représentations de Nordson dans votre pays, veuillez contacter l'un de bureaux ci-dessous.
- Para obtener la dirección de la oficina correspondiente, por favor diríjase a unas de las oficinas principales que siguen abajo.

Contact Nordson	Phone	Fax
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Africa / Middle East

DED, Germany	49-211-92050	49-211-254 658
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Asia / Australia / Latin America

Pacific South Division, USA	1-440-685-4797	–
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Japan

Japan	81-3-5762 2700	81-3-5762 2701
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North America

Canada		1-905-475 6730	1-905-475 8821
USA	Hot Melt	1-770-497 3400	1-770-497 3500
	Finishing	1-880-433 9319	1-888-229 4580
	Nordson UV	1-440-985 4592	1-440-985 4593

Section 1

Safety

Read this section before using the equipment. This section contains recommendations and practices applicable to the safe installation, operation, and maintenance (hereafter referred to as “use”) of the product described in this document (hereafter referred to as “equipment”). Additional safety information, in the form of task-specific safety alert messages, appears as appropriate throughout this document.



WARNING: Failure to follow the safety messages, recommendations, and hazard avoidance procedures provided in this document can result in personal injury, including death, or damage to equipment or property.

Safety Alert Symbols

The following safety alert symbol and signal words are used throughout this document to alert the reader to personal safety hazards or to identify conditions that may result in damage to equipment or property. Comply with all safety information that follows the signal word.



WARNING: Indicates a potentially hazardous situation that, if not avoided, can result in serious personal injury, including death.



CAUTION: Indicates a potentially hazardous situation that, if not avoided, can result in minor or moderate personal injury.

CAUTION: (Used without the safety alert symbol) Indicates a potentially hazardous situation that, if not avoided, can result in damage to equipment or property.

Responsibilities of the Equipment Owner

Equipment owners are responsible for managing safety information, ensuring that all instructions and regulatory requirements for use of the equipment are met, and for qualifying all potential users.

Safety Information

- Research and evaluate safety information from all applicable sources, including the owner-specific safety policy, best industry practices, governing regulations, material manufacturer's product information, and this document.
- Make safety information available to equipment users in accordance with governing regulations. Contact the authority having jurisdiction for information.
- Maintain safety information, including the safety labels affixed to the equipment, in readable condition.

Instructions, Requirements, and Standards

- Ensure that the equipment is used in accordance with the information provided in this document, governing codes and regulations, and best industry practices.
- If applicable, receive approval from your facility's engineering or safety department, or other similar function within your organization, before installing or operating the equipment for the first time.
- Provide appropriate emergency and first aid equipment.
- Conduct safety inspections to ensure required practices are being followed.
- Re-evaluate safety practices and procedures whenever changes are made to the process or equipment.

User Qualifications

Equipment owners are responsible for ensuring that users:

- Receive safety training appropriate to their job function as directed by governing regulations and best industry practices
- Are familiar with the equipment owner's safety and accident prevention policies and procedures
- Receive, equipment- and task-specific training from another qualified individual

NOTE: Nordson can provide equipment-specific installation, operation, and maintenance training. Contact your Nordson representative for information

- Possess industry- and trade-specific skills and a level of experience appropriate to their job function
- Are physically capable of performing their job function and are not under the influence of any substance that degrades their mental capacity or physical capabilities

Applicable Industry Safety Practices

The following safety practices apply to the use of the equipment in the manner described in this document. The information provided here is not meant to include all possible safety practices, but represents the best safety practices for equipment of similar hazard potential used in similar industries.

Intended Use of the Equipment

- Use the equipment only for the purposes described and within the limits specified in this document.
- Do not modify the equipment.
- Do not use incompatible materials or unapproved auxiliary devices. Contact your Nordson representative if you have any questions on material compatibility or the use of non-standard auxiliary devices.

Instructions and Safety Messages

- Read and follow the instructions provided in this document and other referenced documents.
- Familiarize yourself with the location and meaning of the safety warning labels and tags affixed to the equipment. Refer to *Safety Labels and Tags* (if available) at the end of this section.
- If you are unsure of how to use the equipment, contact your Nordson representative for assistance.

Installation Practices

- Install the equipment in accordance with the instructions provided in this document and in the documentation provided with auxiliary devices.
- Ensure that the equipment is rated for the environment in which it will be used and that the processing characteristics of the material will not create a hazardous environment. Refer to the Material Safety Data Sheet (MSDS) for the material.
- If the required installation configuration does not match the installation instructions, contact your Nordson representative for assistance.
- Position the equipment for safe operation. Observe the requirements for clearance between the equipment and other objects.
- Install lockable power disconnects to isolate the equipment and all independently powered auxiliary devices from their power sources.
- Properly ground all equipment. Contact your local building code enforcement agency for specific requirements.
- Ensure that fuses of the correct type and rating are installed in fused equipment.
- Contact the authority having jurisdiction to determine the requirement for installation permits or inspections.

Operating Practices

- Familiarize yourself with the location and operation of all safety devices and indicators.
- Confirm that the equipment, including all safety devices (guards, interlocks, etc.), is in good working order and that the required environmental conditions exist.
- Use the personal protective equipment (PPE) specified for each task. Refer to *Equipment Safety Information* or the material manufacturer's instructions and MSDS for PPE requirements.
- Do not use equipment that is malfunctioning or shows signs of a potential malfunction.

Maintenance and Repair Practices

- Perform scheduled maintenance activities at the intervals described in this document.
- Relieve system hydraulic and pneumatic pressure before servicing the equipment.
- De-energize the equipment and all auxiliary devices before servicing the equipment.
- Use only new or factory-authorized refurbished replacement parts.
- Read and comply with the manufacturer's instructions and the MSDS supplied with equipment cleaning compounds.

NOTE: MSDSs for cleaning compounds that are sold by Nordson are available at www.nordson.com or by calling your Nordson representative.

- Confirm the correct operation of all safety devices before placing the equipment back into operation.
- Dispose of waste cleaning compounds and residual process materials according to governing regulations. Refer to the applicable MSDS or contact the authority having jurisdiction for information.
- Keep equipment safety warning labels clean. Replace worn or damaged labels.

Equipment Safety Information

This equipment safety information is applicable to the following types of Nordson equipment:

- hot melt and cold adhesive application equipment and all related accessories
- pattern controllers, timers, detection and verification systems, and all other optional process control devices

Equipment Shutdown

To safely complete many of the procedures described in this document, the equipment must first be shut down. The level of shut down required varies by the type of equipment in use and the procedure being completed. If required, shut down instructions are specified at the start of the procedure. The levels of shut down are:

Relieving System Hydraulic Pressure

Completely relieve system hydraulic pressure before breaking any hydraulic connection or seal. Refer to the melter-specific product manual for instructions on relieving system hydraulic pressure.

De-energizing the System

Isolate the system (melter, hoses, guns, and optional devices) from all power sources before accessing any unprotected high-voltage wiring or connection point.

1. Turn off the equipment and all auxiliary devices connected to the equipment (system).
2. To prevent the equipment from being accidentally energized, lock and tag the disconnect switch(es) or circuit breaker(s) that provide input electrical power to the equipment and optional devices.

NOTE: Government regulations and industry standards dictate specific requirements for the isolation of hazardous energy sources. Refer to the appropriate regulation or standard.

Disabling the Guns

All electrical or mechanical devices that provide an activation signal to the guns, gun solenoid valve(s), or the melter pump must be disabled before work can be performed on or around a gun that is connected to a pressurized system.

1. Turn off or disconnect the gun triggering device (pattern controller, timer, PLC, etc.).
2. Disconnect the input signal wiring to the gun solenoid valve(s).
3. Reduce the air pressure to the gun solenoid valve(s) to zero; then relieve the residual air pressure between the regulator and the gun.

General Safety Warnings and Cautions

Table 1-1 contains the general safety warnings and cautions that apply to Nordson hot melt and cold adhesive equipment. Review the table and carefully read all of the warnings or cautions that apply to the type of equipment described in this manual.

Equipment types are designated in Table 1-1 as follows:

HM = Hot melt (melters, hoses, guns, etc.)

PC = Process control

CA = Cold adhesive (dispensing pumps, pressurized container, and guns)

Table 1-1 General Safety Warnings and Cautions

Equipment Type	Warning or Caution
HM	 WARNING: Hazardous vapors! Before processing any polyurethane reactive (PUR) hot melt or solvent-based material through a compatible Nordson melter, read and comply with the material's MSDS. Ensure that the material's processing temperature and flashpoints will not be exceeded and that all requirements for safe handling, ventilation, first aid, and personal protective equipment are met. Failure to comply with MSDS requirements can cause personal injury, including death.
HM	 WARNING: Reactive material! Never clean any aluminum component or flush Nordson equipment with halogenated hydrocarbon fluids. Nordson melters and guns contain aluminum components that may react violently with halogenated hydrocarbons. The use of halogenated hydrocarbon compounds in Nordson equipment can cause personal injury, including death.
HM, CA	 WARNING: System pressurized! Relieve system hydraulic pressure before breaking any hydraulic connection or seal. Failure to relieve the system hydraulic pressure can result in the uncontrolled release of hot melt or cold adhesive, causing personal injury.
HM	 WARNING: Molten material! Wear eye or face protection, clothing that protects exposed skin, and heat-protective gloves when servicing equipment that contains molten hot melt. Even when solidified, hot melt can still cause burns. Failure to wear appropriate personal protective equipment can result in personal injury.
Continued...	

General Safety Warnings and Cautions *(contd)*

Table 1-1 General Safety Warnings and Cautions (contd)

Equipment Type	Warning or Caution
HM, PC	 WARNING: Equipment starts automatically! Remote triggering devices are used to control automatic hot melt guns. Before working on or near an operating gun, disable the gun's triggering device and remove the air supply to the gun's solenoid valve(s). Failure to disable the gun's triggering device and remove the supply of air to the solenoid valve(s) can result in personal injury.
HM, CA, PC	 WARNING: Risk of electrocution! Even when switched off and electrically isolated at the disconnect switch or circuit breaker, the equipment may still be connected to energized auxiliary devices. De-energize and electrically isolate all auxiliary devices before servicing the equipment. Failure to properly isolate electrical power to auxiliary equipment before servicing the equipment can result in personal injury, including death.
CA	 WARNING: Risk of fire or explosion! Nordson cold adhesive equipment is not rated for use in explosive environments and should not be used with solvent-based adhesives that can create an explosive atmosphere when processed. Refer to the MSDS for the adhesive to determine its processing characteristics and limitations. The use of incompatible solvent-based adhesives or the improper processing of solvent-based adhesives can result in personal injury, including death.
HM, CA, PC	 WARNING: Allow only personnel with appropriate training and experience to operate or service the equipment. The use of untrained or inexperienced personnel to operate or service the equipment can result in injury, including death, to themselves and others and can damage to the equipment.
<i>Continued...</i>	

Equipment Type	Warning or Caution
HM	 CAUTION: Hot surfaces! Avoid contact with the hot metal surfaces of guns, hoses, and certain components of the melter. If contact can not be avoided, wear heat-protective gloves and clothing when working around heated equipment. Failure to avoid contact with hot metal surfaces can result in personal injury.
HM	CAUTION: Some Nordson melters are specifically designed to process polyurethane reactive (PUR) hot melt. Attempting to process PUR in equipment not specifically designed for this purpose can damage the equipment and cause premature reaction of the hot melt. If you are unsure of the equipment's ability to process PUR, contact your Nordson representative for assistance.
HM, CA	CAUTION: Before using any cleaning or flushing compound on or in the equipment, read and comply with the manufacturer's instructions and the MSDS supplied with the compound. Some cleaning compounds can react unpredictably with hot melt or cold adhesive, resulting in damage to the equipment.
HM	CAUTION: Nordson hot melt equipment is factory tested with Nordson Type R fluid that contains polyester adipate plasticizer. Certain hot melt materials can react with Type R fluid and form a solid gum that can clog the equipment. Before using the equipment, confirm that the hot melt is compatible with Type R fluid.

Other Safety Precautions

- Do not use an open flame to heat hot melt system components.
- Check high pressure hoses daily for signs of excessive wear, damage, or leaks.
- Never point a dispensing handgun at yourself or others.
- Suspend dispensing handguns by their proper suspension point.

First Aid

If molten hot melt comes in contact with your skin:

1. Do NOT attempt to remove the molten hot melt from your skin.
2. Immediately soak the affected area in clean, cold water until the hot melt has cooled.
3. Do NOT attempt to remove the solidified hot melt from your skin.
4. In case of severe burns, treat for shock.
5. Seek expert medical attention immediately. Give the MSDS for the hot melt to the medical personnel providing treatment.

Section 2

Introduction

Intended Use

Adhesive melters of the series *VersaBlue*® may be used only to melt and convey suitable materials, e.g. thermoplastic hot melt adhesives.

Any other use is considered to be unintended. Nordson will not be liable for personal injury or property damage resulting from unintended use.

Intended use includes the observance of Nordson safety instructions. Nordson recommends obtaining detailed information on the materials to be used.

Area of Use (EMC)

In regard to electromagnetic compatibility (EMC), the melter is intended for use in industrial applications.

Operating Restrictions

When operated in residential or commercial areas, the melter may cause interference in other electrical units, e.g. radios.

Unintended Use – Examples –

The melter may not be used under the following conditions:

- In defective condition
- Without insulation blanket and protective panels
- With electrical cabinet door open
- With tank lid open
- In a potentially explosive atmosphere
- When the values stated under *Technical Data* are not complied with.

The melter may not be used to process the following materials:

- Polyurethane hot melt adhesive (PUR)
- Explosive and flammable materials
- Erosive and corrosive materials
- Food products.

Residual Risks

In the design of the unit, every measure was taken to protect personnel from potential danger. However, some residual risks can not be avoided:

- Risk of burns from hot material.
- Risk of burns when filling the tank, from the tank lid, and from the tank lid supports.
- Risk of burns when conducting maintenance and repair work for which the melter must be heated up.
- Risk of burns when attaching and removing heated hoses.
- Material fumes can be hazardous. Avoid inhalation.
- Risk of damage to cables/lines belonging to the customer, if they were installed such that they come into contact with hot or rotating parts.
- The safety valve may malfunction due to hardened or charred material.

Definition of Terms

Interface Standard I/O

Component designation: XS 2

Transmits the digital input and output signals between the parent machine and the Nordson melter.

Interface Key-to-line Mode

Component designation: XS 5 (one line speed signal input for all motors) XS 5.1, XS 5.2, XS 5.3 and XS 5.4 (option: separate line speed signal inputs).

NOTE: *Key-to-line* is also referred to as *Automatic mode* in Nordson literature.

In key-to-line the motor/pump speed is regulated synchronously to the speed of the parent machine.

The types described in this manual can be operated in key-to-line mode with a line speed voltage of 0 – 10 V_{DC}.

Encoder

The encoder compiles the line speed of the parent machine. It supplies a certain number of electrical pulses per revolution. The frequency is a measure of line speed.

CAUTION: The cable length may not be modified; this could cause incorrect evaluation of the line speed, resulting in incorrect material applications.

Symbols



Nordson default



Reset

Melter Description

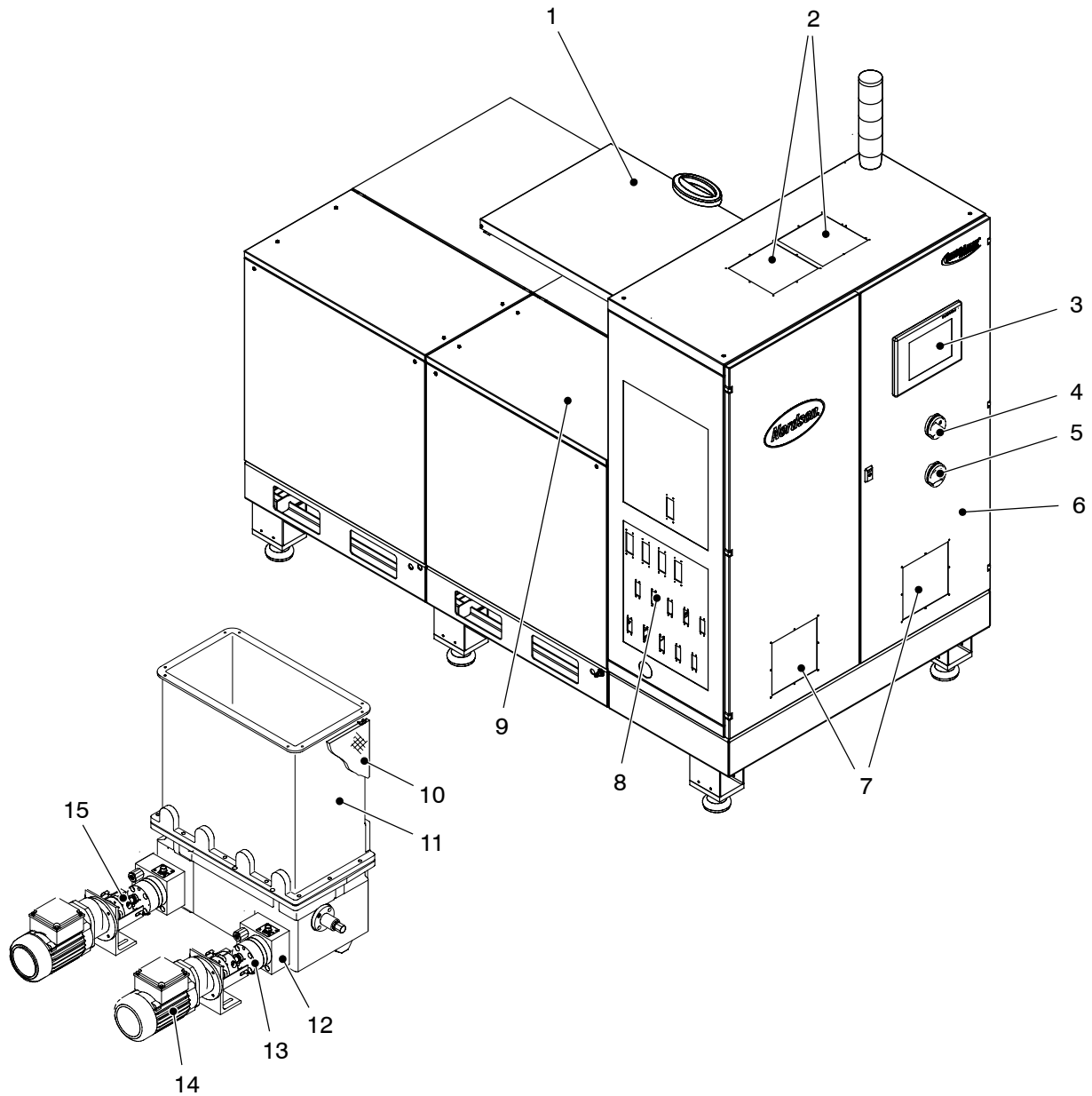


Fig. 2-1 Example VBC-200

- | | | |
|------------------------|-----------------------|-----------------------|
| 1 Tank lid | 7 Fan | 12 Safety valve plate |
| 2 Air filter | 8 Receptacles | 13 Gear pump |
| 3 Control panel | 9 Protective panel | 14 Motor |
| 4 Main switch | 10 Insulation blanket | 15 Coupling |
| 5 Motor circuit switch | 11 Tank | |
| 6 Electrical cabinet | | |

Melter Description *(contd.)*

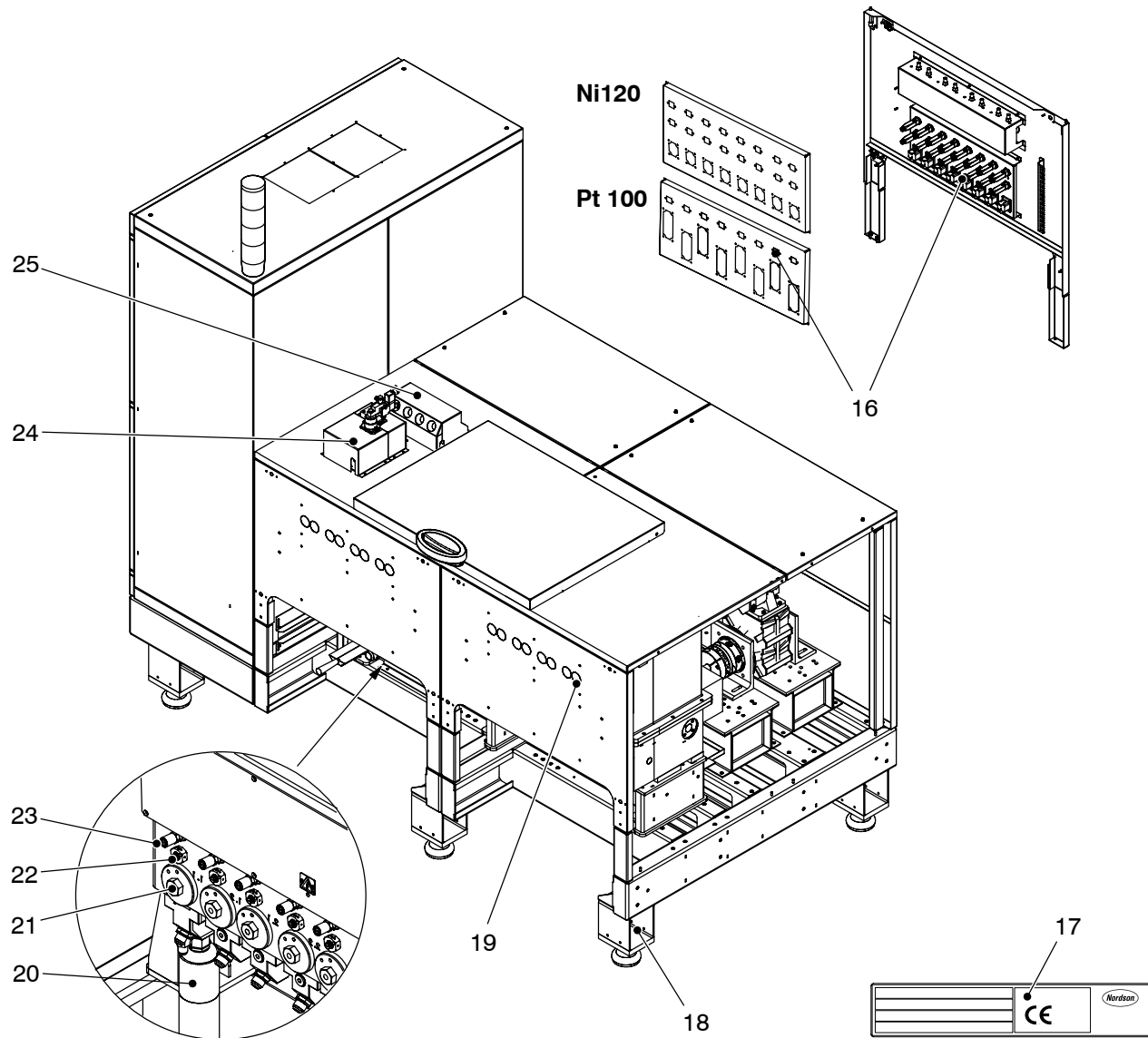


Fig. 2-2

- | | | |
|----------------------------|---------------------------|---------------------------------------|
| 16 Hose receptacles | 20 Hose (accessory) | 23 Air relief valve |
| 17 ID plate | 21 Filter cartridge | 24 Filling valve (option) |
| 18 Machine foot | 22 Pressure control valve | 25 Recirculation connections (option) |
| 19 Pressure gauge (option) | | |

Melter Description *(contd.)*

Tank

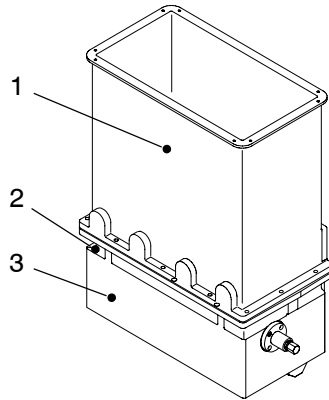


Fig. 2-3

The tank is divided into grid (low melt) and reservoir (high melt) sections. An insulating seal (2) provides a temperature barrier between the two sections. The temperature barrier allows the material in the grid section (1) to be gently melted at a low temperature. The material is then melted to processing temperature in the reservoir (3).

Safety Valve Plate

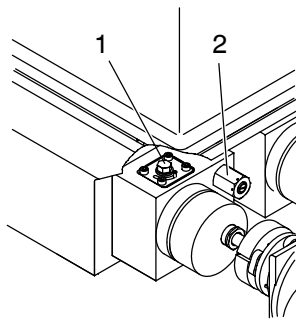


Fig. 2-4

Tank Isolation Valve

The tank isolation valve (1) enables replacement of the gear pump without first emptying the tank.

Safety Valve

The standard safety valve (2) is fixed at

8500 kPa	85 bar	1235 psi
----------	--------	----------

When the pressure is exceeded, the safety valve opens, allowing the material to circulate within the safety valve plate.

Mechanical Pressure Control Valve

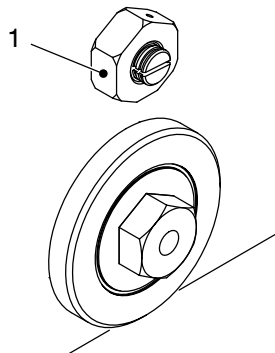


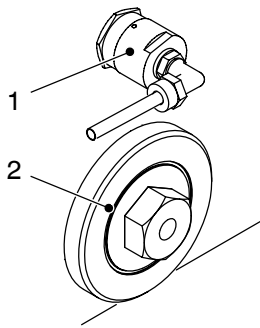
Fig. 2-5

The mechanical pressure control valves (1) are built into the manifold above the filter cartridge. They can be adjusted manually within the range of

500 to 9000 kPa	5 to 90 bar	72.5 to 1305 psi
-----------------	-------------	------------------

One pressure control valve per pump is standardly installed after the filter cartridge.

Pneumatic Pressure Control Valve



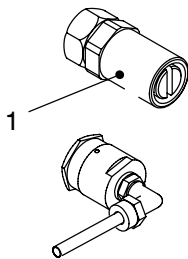
The pneumatic pressure control valves (1) can be installed instead of the mechanical pressure control valves. They are also located in the manifold.

They are connected to the pneumatic control unit in the melter with one pneumatic hose each.

Fig. 2-6

- 1 Pressure control valve
- 2 Filter cartridge

Air Relief Valve



There are air relief valves (1) in the manifold. They allow the air entering the manifold when the filter cartridge is replaced to escape.

Fig. 2-7

Material Flow

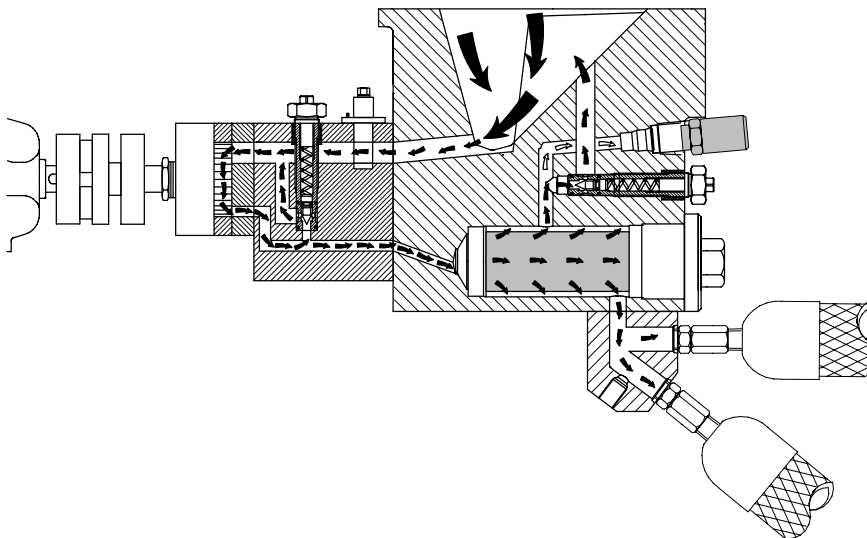
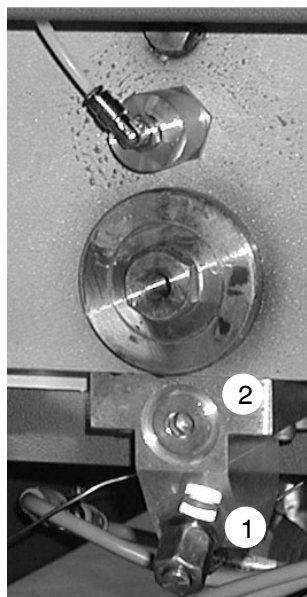


Fig. 2-8 Cross-sectional view of the reservoir – principle drawing

Melter Description *(contd.)*

Identification of Hose Connections



The melter supplies various material streams (pump streams) that are guided through the hoses to the different gear metering pump stations or guns. Engraved numbers identify the hose connections so that the pump streams can be correctly paired with the hoses.

The hose connection that leads down is number 1, the one above it number 2. The hose connections are numbered from right to left beginning with 1 (to 4).

NOTE: Two hose connections per single-stream pump are possible. Four hose connections per double-stream pump are possible.

Fig. 2-9

Example 1: Hose connection numbering for single-stream pumps

Pump number	4	3	2	1
Numbers	Top: 2	Top: 2	Top: 2	Top: 2
	Bottom: 1	Bottom: 1	Bottom: 1	Bottom: 1
Possible hose connections	4.1	3.1	2.1	1.1
	4.2	3.2	2.2	1.2

Example 2: Hose connection numbering for double-stream pumps

Pump number	4	3	2	1
Pump stream (filter cartridge)	Right: 4.1	Right: 3.1	Right: 2.1	Right: 1.1
	Left: 4.2	Left: 3.2	Left: 2.2	Left: 1.2
Numbers	Top: 2	Top: 2	Top: 2	Top: 2
	Bottom: 1	Bottom: 1	Bottom: 1	Bottom: 1
Possible hose connections	4.1.1	3.1.1	2.1.1	1.1.1
	4.1.2	3.1.2	2.1.2	1.1.2
	4.2.1	3.2.1	2.2.1	1.2.1
	4.2.2	3.2.2	2.2.2	1.2.2

Electrical Cabinet

Side with Receptacles

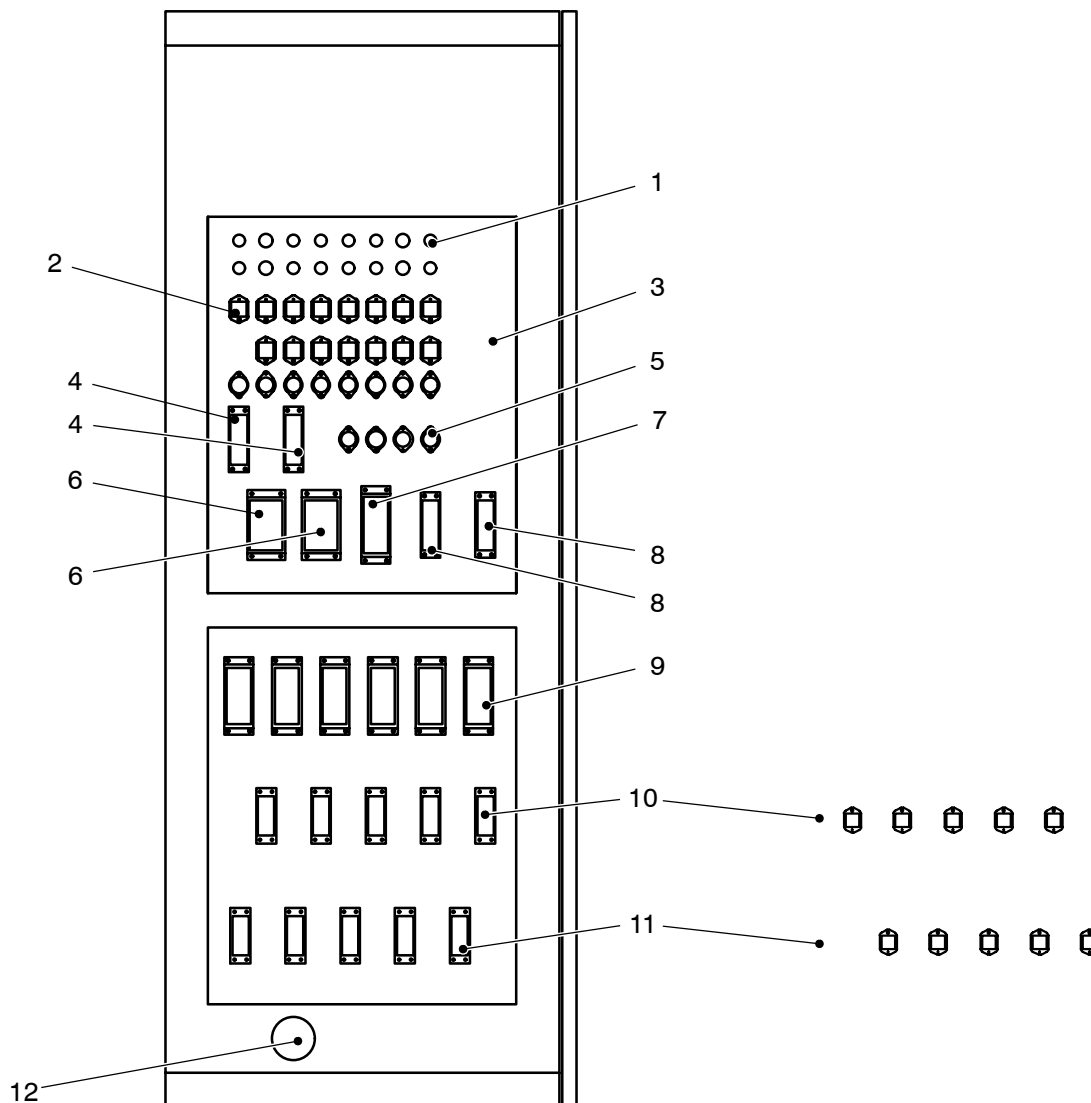
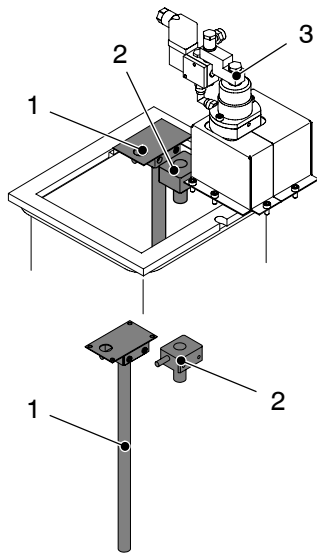


Fig. 2-10

- | | | |
|---|--|--|
| 1 Air run-up, XS 32.n | 6 Standard I/O, XS 2, XS 2.1 | 11 External heating zones XS 26 to XS 30 (Pt 100 / Ni 120) |
| 2 Key-to-line, XS 5 | 7 Cable duct, XS D | 12 Cable gland <i>Power supply</i> |
| 3 Separate line speed signal inputs, XS 5.n | 8 Level control, XS 3, XS 3.1 | |
| 4 Pneumatic pressure control / bypass control, XS 4, XS 4.1 | 9 Motors, n.XS 1 | |
| 5 Pressure switch, XS 31.n | 10 External heating zones XS 31 to XS 35 (Pt 100 / Ni 120) | |

Options

Level Control / Overflow Protection



The long level sensor (1) is connected to the analog level display and transmits filling signals to a filling valve.

The short level sensor (2) serves as separate overflow protection. The signal is made available to the customer for further evaluation at the interface *Level control*. It is not evaluated by the PLC. The signal must be acknowledged. Refer to Troubleshooting, Overflow protection is activated...

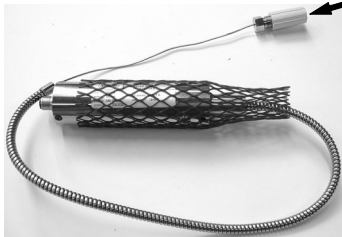
The filling valve (3) for automatic tank filling is located on the tank.

The filling valve control module opens when the solenoid valve is triggered. The material is conveyed into the melter tank, e.g. by a bulk melter.

Fig. 2-11

Options *(contd.)*

Pressure Display



The pressure sensors (Fig. 2-12 and 2, Fig. 2-13) for material outlet pressure are located in the hose connections. The corresponding measuring transducers (2) are located below the manifold. The last pressure sensor along the bus must be equipped with a terminating resistor (3).

Fig. 2-12

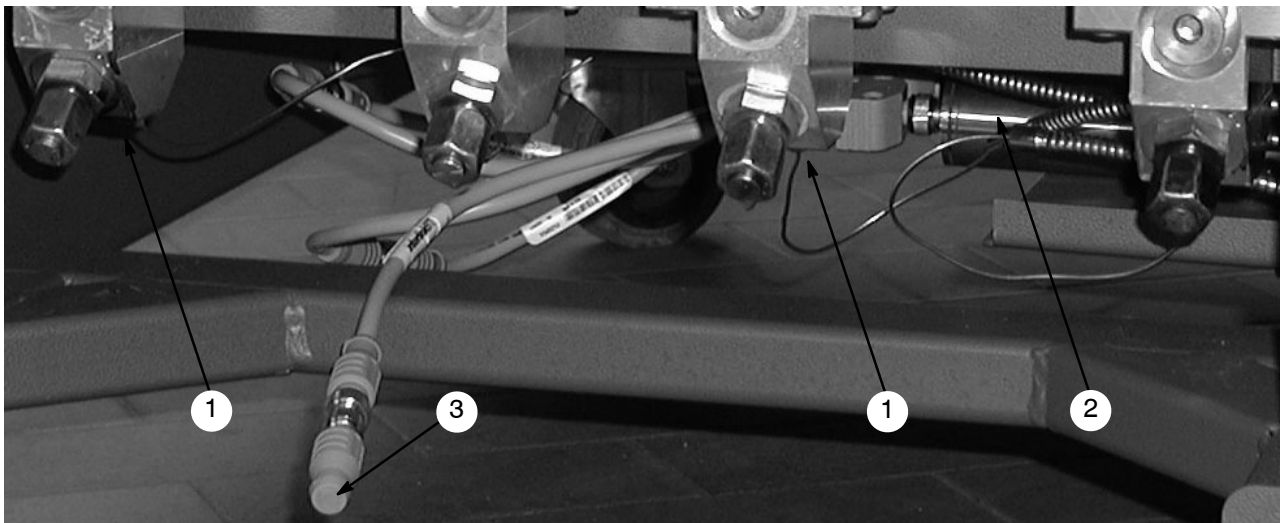


Fig. 2-13 Pressure sensors in the hose connections

Pressure Display

Each pump stream is equipped with a pressure sensor for the pressure display in systems with only double-stream pumps and in systems with both single-stream and double-stream pumps.

Pressure Display and Pressure Control Pressure Build-up

The single-stream pump is equipped with a pressure sensor for the pressure display and control in systems with both single-stream and double-stream pumps. In the double-stream pump each pump stream is equipped with a pressure sensor for the pressure display. However, only one each is used for pressure control.

In systems consisting only of double-stream pumps, each pump is equipped with two pressure sensors for the pressure display. However, only one each is used for pressure control.

ID Plate

The system has two ID plates. One is located on the outside of the melter (Refer to Fig. 2-2), and the other is in the electrical cabinet.

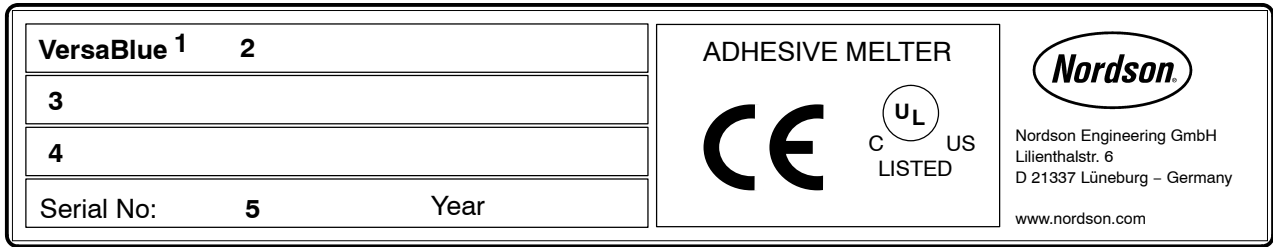


Fig. 2-14

1	Melter designation
2	Order number
3	Configuration code
4	Electrical connection, operating voltage, line voltage frequency, melter fuse protection
5	Serial number

Section 3

Installation



WARNING: Allow only qualified personnel to perform the following tasks. Observe and follow the safety instructions in this document and all other related documentation.

Transport



Fig. 3-1

- Refer to section *Technical Data* for weight. Use only suitable transport devices.
- If possible, use the pallet (2) that came with the melter and use angle brackets to fasten the melter.
- Use sturdy cardboard or a box (1) to protect from damage.
- Protect from humidity and dust.
- Avoid jolts and vibrations.

Storage

CAUTION: Do not store melter outside! Protect from humidity, dust and extreme temperature fluctuations (formation of condensation).

Unpacking

Unpack carefully and check for damage caused during transport. Save pallet, angle brackets and box for later use, or dispose of it properly according to local regulations.

Lifting (Unpacked Melter)

Refer to the section *Technical Data* for weight. Lift only

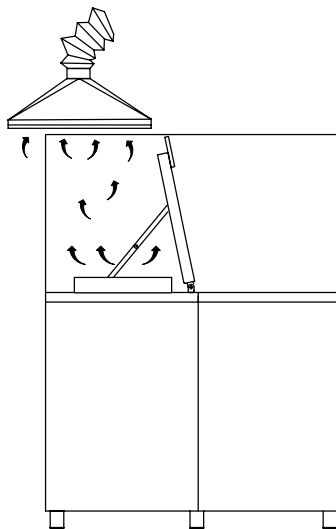
- With suitable lifting equipment on the melter chassis
- With a forklift. There are tracks for the forklift under the melter chassis.

Installation Requirements

Set up only in an environment that corresponds to the stated Degree of Protection (Refer to section *Technical Data*). Do not mount in a potentially explosive atmosphere! Protect from vibration.

CAUTION: Protect the control panel from direct sunlight. The UV rays reduce the service life of the liquid crystals.

Exhausting Material Vapors



Ensure that material vapors do not exceed the prescribed limits. Always observe the safety data sheet (MSDS) for the material to be processed. If necessary, exhaust material vapors and provide sufficient ventilation of the location of the system.

Fig. 3-2

Required Space

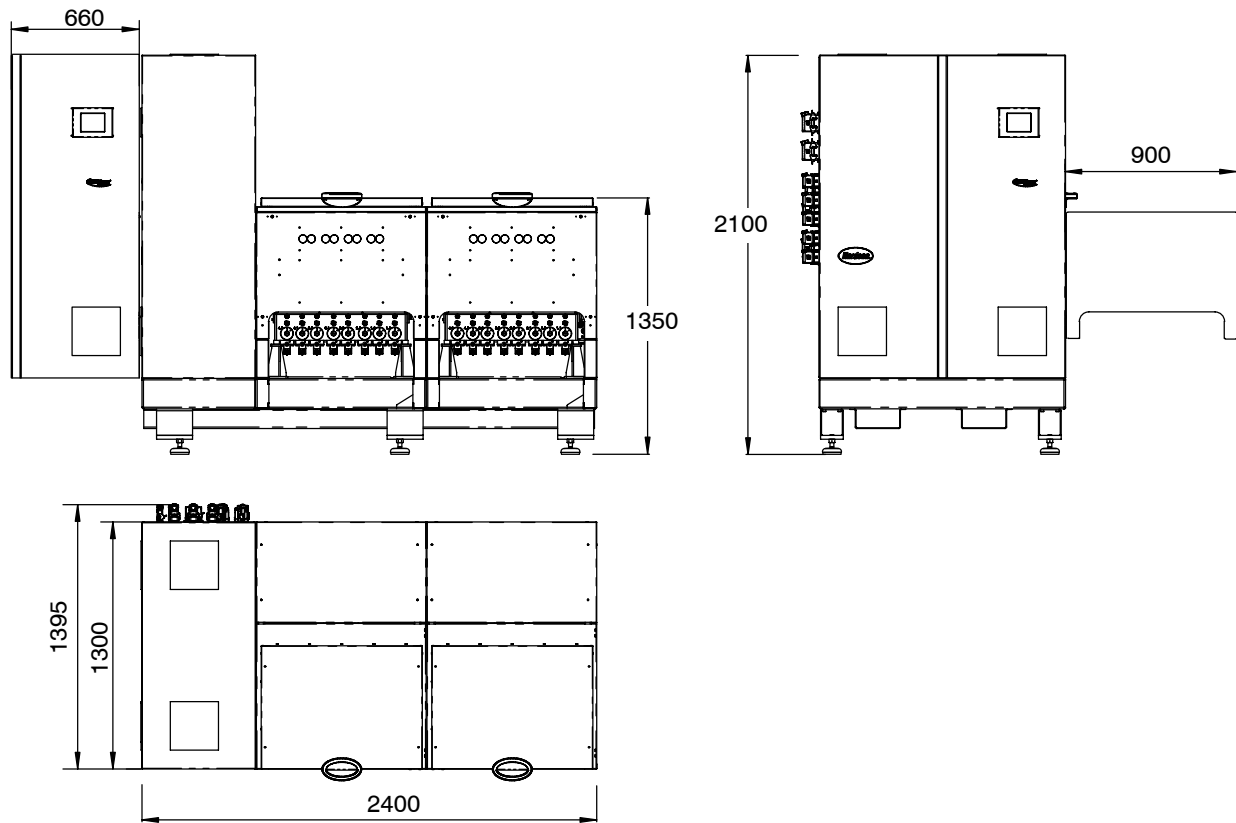


Fig. 3-3 Type VB C with tank extension (hopper)

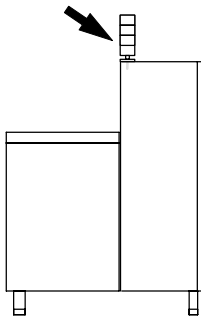
Installation Personnel's Experience

The instructions contained in this section are intended for personnel with experience/authorization in the following fields:

- Application methods with hot melt adhesive or similar materials
- Industrial electrical wiring of power and control lines
- Industrial mechanical installation
- General knowledge of process control.

CAUTION: Illuminated seals may not be installed in the application system.

Screwing on Light Tower (Option)

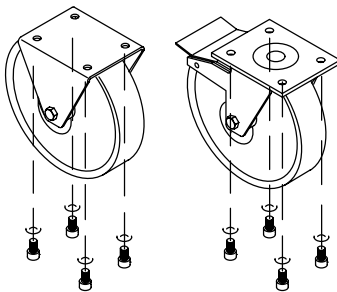


The light tower is not attached upon delivery of the melter. Use the two screws M5 to fasten the light tower to the top of the electrical cabinet.

Fig. 3-4

Casters

Installing Kit



The kit consists of two pair of casters with brakes and one pair of fixed wheels without brakes.

NOTE: Attach the casters with brakes (Fig. 3-5, right) to the side of the electrical cabinet and in the center of a twin tank unit.

1. Lift the melter with a suitable floor conveyor (e.g. fork lift).
2. Detach machine feet.
3. Attach casters. Use the fastening holes for the machine feet to attach the casters.

Fig. 3-5

Electrical Connections



WARNING: Risk of electrical shock. Failure to observe may result in personal injury, death, or equipment damage.

Important Note When Using Residual Current Circuit Breakers

Local regulations in some industrial branches require residual current circuit breakers.

Then observe the following points:

- Residual current circuit breakers are to be installed only between the power supply and the melter.
- Use only residual current circuit breakers sensitive to pulsating current or universal current ($> 30 \text{ mA}$).

Laying Cable



WARNING: Use only temperature resistant cable in warm areas of the equipment. Ensure that cables do not touch rotating and/or hot melter components. Do not pinch cables and check regularly for damage. Replace damaged cables immediately!

Operating Voltage



WARNING: Operate only at the operating voltage shown on the ID plate.

NOTE: Permitted deviation from the rated line voltage is $\pm 10\%$.

NOTE: The power cable cross-section must comply with the maximum power consumption (refer to section *Technical Data*).

External Control/Signal Circuits

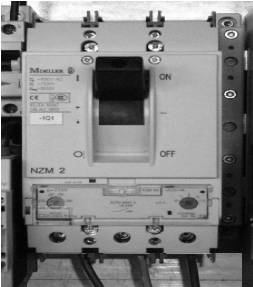
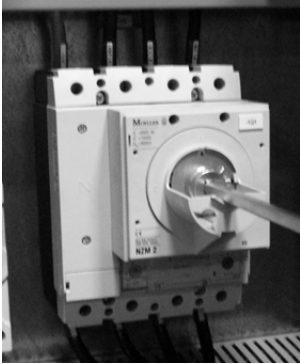


WARNING: Connect external control and signal circuits with suitable cable in accordance with the NEC, class 1. To prevent short-circuiting, lay the cables such that they do not touch printed circuits on PCBs.

Electrical Connections *(contd.)*

Power Supply Connection

NOTE: The melter must be installed securely (permanent power supply connection).

Operating voltage	Terminals					Mains terminals in electrical cabinet
	L1	L2	L3	N	PE	
230 V _{AC} 3-phase without neutral (<i>Delta</i>)	●	●	●		●	
400 V _{AC} 3-phase with neutral (star – <i>WYE</i>)	●	●	●	●	●	
Refer to wiring diagram for connecting arrangement.						

Connecting Hose

Also refer to the hose manual.

Connecting Electrically

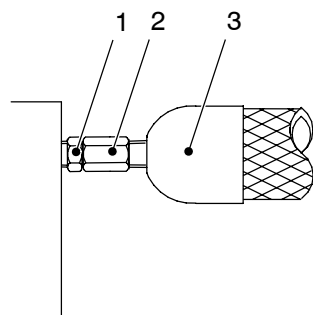


Fig. 3-6

1. First connect the hose (3) electrically to the unit.

Use hose receptacles XS10 to XS17 (Fig. 3-7, bottom row) for the plugs of the hoses.

If there are more than eight hoses, use the hose receptacles XS 26(a) to XS 35(a) on the electrical cabinet.

NOTE: For more than one hose: Every hose connection is allocated to a corresponding receptacle. Do not mistakenly exchange!

Refer to wiring diagram for connecting arrangement.

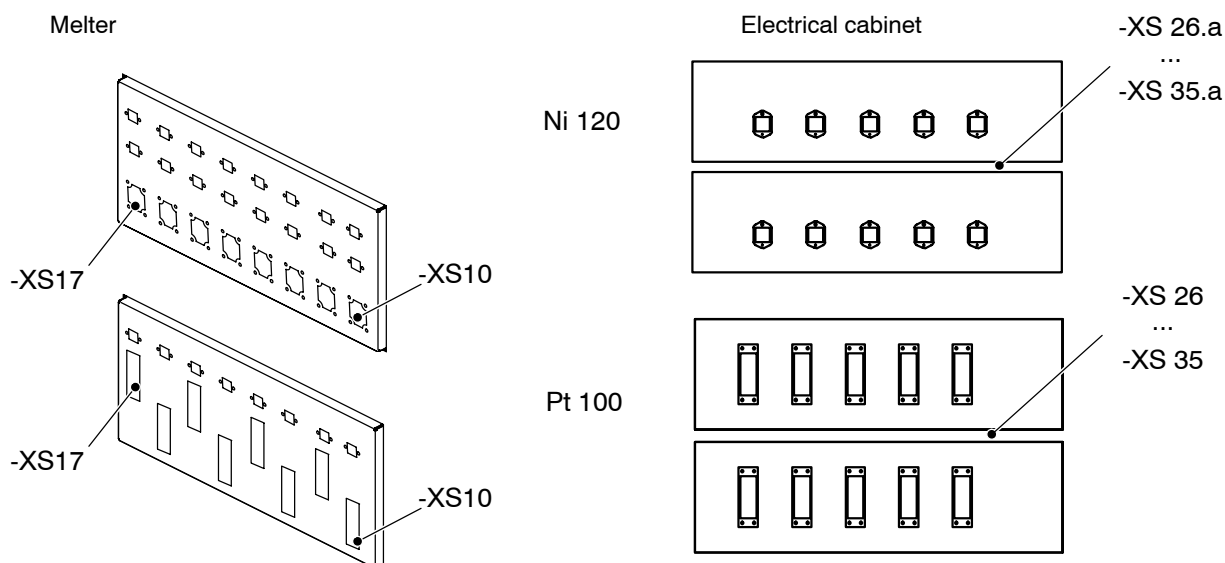


Fig. 3-7

Connecting

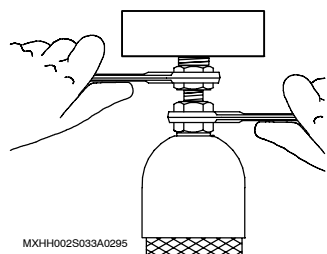


Fig. 3-8

Second Open-jawed Wrench

Use a second open-jawed wrench when connecting and disconnecting the hose. This prevents the unit's hose connection from turning.

Connecting (contd.)

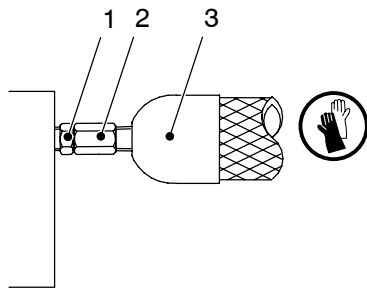


Fig. 3-9

NOTE: For units with recirculation hoses: do not mistake recirculation hoses for feed hoses.

If cold material can be found in the hose connection, the components (1, 2) must be heated until the material softens (approx. 70 °C (158 °F), depending on material).

WARNING: Hot! Risk of burns. Wear heat-protective gloves.

2. Heat the melter and hose to approx. 70 °C (158 °F).

CAUTION: Close unused hose connections with Nordson port plugs.

Disconnecting



WARNING: System and material pressurized. Relieve system pressure before disconnecting hoses. Failure to observe can result in serious burns.

Relieving Pressure

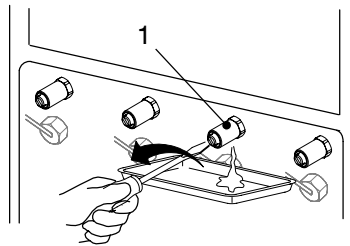


Fig. 3-10

1. Set motor speed to 0 min⁻¹ (rpm). Switch off the motor(s) (Refer to section *Operation*).
2. Place a container under the air relief valves (1, Fig. 3-10) to be opened.
3. Use a screwdriver to turn the air relief valve screws counterclockwise and open the valves.
4. Material flows out of the air relief hole, and the melter is relieved of pressure.
5. Use a screwdriver to turn the air relief valve screws clockwise and close the valves.
6. Place a container under the nozzle(s) of the gun / assembly handgun.
7. Activate the solenoid valve(s) electrically or manually, or pull the trigger of the assembly handgun. Repeat this procedure until no more material flows out.
8. Properly dispose of material according to local regulations.

Connecting Filling Valve (Option)

Conditioning Compressed Air

The quality of the compressed air must be at least class 2 in compliance with ISO 8573-1. This means:

- Max. particle size 30 μm
- Max. particle density 1 mg/m^3
- Max. pressure dew point – 40 °C
- Max. oil concentration 0.1 mg/m^3

1. Connect customer's compressed air supply to the control air connection (2).

4 to 6 bar	400 to 600 kPa	58 to 87 psi
------------	----------------	--------------

2. Electrically/mechanically connect hose to the filling unit.
3. Connect hose to filling valve connection (1) (Refer to illustration).

The filling valve is heated either via the VersaBlue melter or via the filling unit (e.g. bulk melter).

4. If heating does not occur via the VersaBlue melter, insert the electrical plug (cordset) into the hose receptacle.

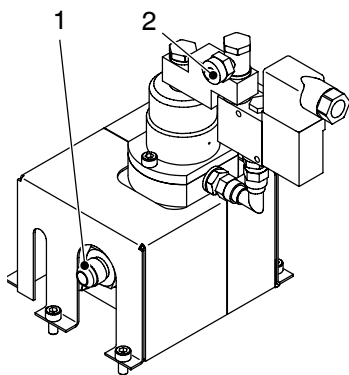
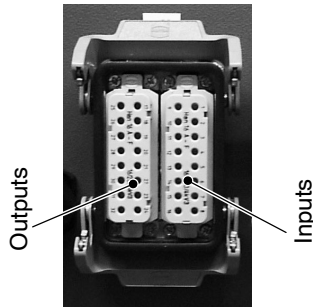


Fig. 3-11

Interface Assignment

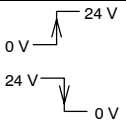
Interface Standard I/O – Standard Assignment for XS 2 –



General Information

- To conform with a European standard regarding electro-magnetic compatibility (EMC), only shielded cable may be connected. The cable must be connected to ground in compliance with the standard regarding electromagnetic compatibility.
- Inductive loads (e.g. solenoid valves) connected to the melter must be equipped with a protective device (e.g. recovery diode) that disables the inductive voltage generated when an inductive load is switched off.
- The permitted voltage deviation is $\pm 10\%$.
- In *Field bus* mode (option *Field bus communication*) the unit can not be controlled via the interface.

Digital inputs		
Pin	Input	Function
1*	24 V _{DC}	Internal (melter)
2*	0 V _{DC}	External (customer's) NOTE: Customer connects his reference potential here, if 24 V _{DC} is provided by customer.
3		Rising edge: Heaters ON (main contactor closes) Falling edge: Heaters OFF (main contactor opens)
4		24 V: Both motors ON (collective enable) 0 V: Both motors OFF
5		24 V: Enable <i>Motor 1</i> 0 V: No <i>Motor 1</i> enable
6		24 V: Enable <i>Motor 2</i> 0 V: No <i>Motor 2</i> enable
9		Rising edge: Switch on <i>Standby</i> Falling edge: Switch off <i>Standby</i>
10		Rising edge: Key-to-line mode (for both motors) Falling edge: Manual mode (for both motors)
* optional		

Digital inputs		
Pin	Input	Function
11		Rising edge: Switch application group to control mode (input 1) Falling edge: Switch application group to standby or Falling edge: Deactivate application group <i>(Standby or Deactivate is dependent on the function selected on the control panel, refer to section Operation, Working with Application Groups, Setup, Selecting Feature)</i>
12		Like pin 11 (input 2)
13		Like pin 11 (input 3)
14		Like pin 11 (input 4)
15		Line started / stopped
Pin 7, 8, 16 not assigned		

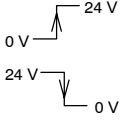
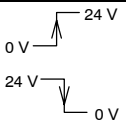
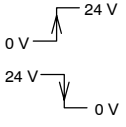
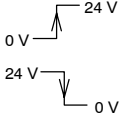
NOTE: Contact rating max. 24 V_{DC}/2 A

Digital outputs		
Pin	Contact	Function
17	Make contact	Contact closed: Motor 1 running
18		Contact open: Motor 1 not running
19	Make contact	Contact closed: Motor 2 running
20		Contact open: Motor 2 not running
25	24 V _{DC}	External (customer's; to be connected by customer)
26	Make contact	24 V: System ready 0 V: System not ready
27	Break contact	24 V: No general alarm –warning– 0 V: General alarm –warning–
28	Break contact	24 V: No general alarm –fault– 0 V: General alarm –fault–
Pin 29 not assigned		
30	Break contact	Pressure buildup completed
31	Make contact	Contact closed: Fill tank Contact open: Do not fill tank
32		NOTE: Pins 31 and 32 are not assigned with the options <i>Level control</i> and <i>Level control with overflow protection</i> . Instead, there is the interface <i>Level control</i> .
Pin 21, 22, 23, 24 not assigned		

Interface Standard I/O – Standard Assignment for XS 2.1 –

Digital inputs		
Pin	Input	Function
1*	24 V _{DC}	Internal (melter)
2*	0 V _{DC}	External (customer's) NOTE: Customer connects his reference potential here, if 24 V _{DC} is provided by customer.
5		24 V: Enable <i>Motor 5</i> 0 V: No <i>Motor 5</i> enable
6		24 V: Enable <i>Motor 6</i> 0 V: No <i>Motor 6</i> enable
9		24 V: Enable <i>Motor 7</i> 0 V: No <i>Motor 7</i> enable
10		24 V: Enable <i>Motor 8</i> 0 V: No <i>Motor 8</i> enable
11		24 V: Enable <i>External motors</i> 0 V: No <i>External motors</i> enable
<i>Pins 3, 4, 7, 8, 12 to 16 not assigned</i>		
* optional		

Standard I/O Interface – XS2 Assignment with Option Solenoid Valve Control –

Digital inputs		
Pin	Input	Function
1*	24 V _{DC}	Internal (melter)
2*	0 V _{DC}	External (customer's) NOTE: Customer connects his reference potential here, if 24 V _{DC} is provided by customer.
3		Rising edge: Heaters ON (main contactor closes) Falling edge: Heaters OFF (main contactor opens)
4		24 V: All motors ON (collective enable) 0 V: All motors OFF
5		24 V: Enable <i>Motor 1</i> 0 V: No <i>Motor 1</i> enable
6		24 V: Enable <i>Motor 2</i> 0 V: No <i>Motor 2</i> enable
9		Rising edge: Switch on <i>Standby</i> Falling edge: Switch off <i>Standby</i>
10		Rising edge: Key-to-line mode (for all motors) Falling edge: Manual mode (for all motors)
11		Rising edge: Switch application group to control mode (input 1) Falling edge: Switch application group to standby or Falling edge: Deactivate application group (<i>Standby</i> or <i>Deactivate</i> is dependent on the function selected on the control panel, refer to section <i>Operation, Working with Application Groups, Setup, Selecting Feature</i>)
12		Like pin 11 (input 2)
13		Like pin 11 (input 3)
14		Like pin 11 (input 4)
15		Line started / stopped
Pin 7, 8, 16 not assigned		
* optional		

NOTE: Contact rating max. 24 V_{DC}/2 A

Digital outputs		
Pin	Contact	Function
17	Make contact	24 V: External solenoid valve 1 is triggered
18		0 V: External solenoid valve 1 is not triggered
19	Make contact	24 V: External solenoid valve 2 is triggered
20		0 V: External solenoid valve 2 is not triggered
25	24 V _{DC}	External (customer's; to be connected by customer)
26	Make contact	24 V: System ready 0 V: System not ready
27	Break contact	24 V: No general alarm –warning– 0 V: General alarm –warning–
28	Break contact	24 V: No general alarm –fault– 0 V: General alarm –fault–
Pin 29 not assigned		
30	Break contact	Pressure buildup completed
31	Make contact	Contact closed: Fill tank Contact open: Do not fill tank
32		NOTE: Pins 31 and 32 are not assigned with the options <i>Level control</i> and <i>Level control with overflow protection</i> . Instead, there is the interface <i>Level control</i> .
Pin 21, 22, 23, 24 not assigned		

NOTE: Contact rating max. 24 V_{DC}/2 A

Digital outputs		
Pin	Contact	Function
17	Make contact	Contact closed: <i>Motor 5</i> running
18		Contact open: <i>Motor 5</i> not running
19	Make contact	Contact closed: <i>Motor 6</i> running
20		Contact open: <i>Motor 6</i> not running
21	Make contact	Contact closed: <i>Motor 7</i> running
22		Contact open: <i>Motor 7</i> not running
23	Make contact	Contact closed: <i>Motor 8</i> running
24		Contact open: <i>Motor 8</i> not running
<i>Pins 25 to 32 not assigned</i>		

Interface Standard I/O – XS2.1 Assignment with Option Solenoid Valve Control –

Digital inputs		
Pin	Input	Function
1*	24 V _{DC}	Internal (melter)
2*	0 V _{DC}	External (customer's) NOTE: Customer connects his reference potential here, if 24 V _{DC} is provided by customer.
Pin 3 not assigned		
Pin 4 not assigned		
5		24 V: Enable Motor 5 0 V: No Motor 5 enable
6		24 V: Enable Motor 6 0 V: No Motor 6 enable
Pin 7 not assigned		
Pin 8 not assigned		
9		24 V: Enable Motor 7 0 V: No Motor 7 enable
10		24 V: Enable Motor 8 0 V: No Motor 8 enable
11		External motors' collective enable
Pins 12 to 16 not assigned		
* optional		

NOTE: Contact rating max. 24 V_{DC}/2 A

Digital outputs		
Pin	Contact	Function
17	Make contact	24 V: External solenoid valve 5 is triggered
18		0 V: External solenoid valve 5 is not triggered
19	Make contact	24 V: External solenoid valve 6 is triggered
20		0 V: External solenoid valve 6 is not triggered
21	Make contact	24 V: External solenoid valve 7 is triggered
22		0 V: External solenoid valve 7 is not triggered
23	Make contact	24 V: External solenoid valve 8 is triggered
24		0 V: External solenoid valve 8 is not triggered
Pins 25 to 32 not assigned		

Interface Gun Solenoid Valve Control

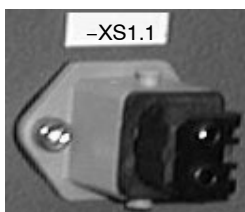


Fig. 3-12

XS1.1 to XS8.1 (3-pin)		
Pin	Output	Function
1	– (Ground)	Digital output
2	24 V _{DC}	
Pin 3 not assigned		

XS1.2 to XS8.2 (3-pin)		
Pin	Output	Function
1	– (Ground)	Digital output via XS 2
2	24 V _{DC}	
Pin 3 not assigned		

XS1.3 to XS8.3 (3-pin)		
Pin	Output	Function
1	– (Ground)	Digital output via XS 2
2	24 V _{DC}	
Pin 3 not assigned		

XS1.4 to XS8.4 (3-pin)		
Pin	Output	Function
1	– (Ground)	Digital output via XS 2
2	24 V _{DC}	
Pin 3 not assigned		

Interface Key-to-line Mode

In *Field bus* mode (option *Field bus communication*) the line speed signals are deactivated.

One Line Speed Signal Input for all Motors

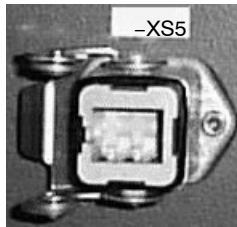


Fig. 3-13

XS5		
Pin	Input	Function
1	– (Ground)	Analog input
2	0 to 10 V	
Pin 3 to 5 not assigned		

Separate Line Speed Signal Inputs

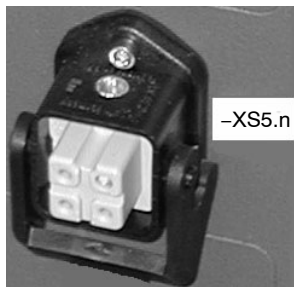
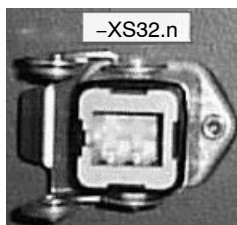


Fig. 3-14

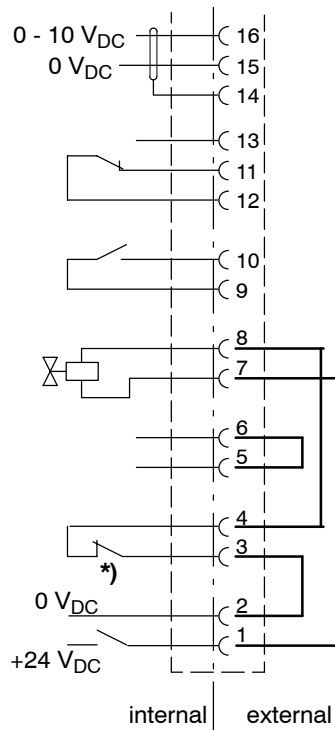
XS5.1 to XS 5.2 (3-pin)		
Pin	Input	Function
1	– (Ground)	Analog input
2	0 to 10 V _{DC}	
Pin 3 not assigned		

Interface Air run-up



XS32.1 to 32.16		
Pin	Output	Function
1	24 V	Analog output
2	0 to 10 V	
3	– (Ground)	

Interface Level Control



NOTE: Available only with options *Level control* and *Level control with overflow protection*.

Component designation: XS3

Fig. 3-15 Default bridges

Digital inputs/outputs			
Pin	Input	Output	Function
1	–	24 V _{DC}	Internal voltage supply of separate overflow protection
2	–	0 V _{DC}	
3	–	24 V _{DC} / 2 A	<i>Fill tank</i> signal to filling valve – Additionally with level control with overflow protection – *) Tank is overfilled (contact open when level is exceeded)
4	–	–	
5	–	–	– Only with level control with overflow protection – Reset (resets signal <i>Tank is overfilled</i>)
6	–	–	
7	+24 V _{DC}	–	Voltage supply to filling valve
8	0 V _{DC}	–	
9	–	24 V _{DC} / 2 A	Fill tank
10	–	–	
11	–	24 V _{DC} / 2 A	– Only with level control with overflow protection – Tank overfilled NOTE: Potential-free changeover contact for evaluation by customer
12	–	–	
13	–	–	
14	–	0 – 10 V	Analog value level control
15	–	Ground	
16	–	Screen	

Removing Melter

Run the melter until empty, separate all connections from the melter, and allow the melter to cool down.

Disposing of Melter

When your Nordson product has exhausted its purpose, dispose of it properly according to local regulations.

Section 4

Operation



WARNING: Allow only qualified personnel to perform the following tasks. Observe and follow the safety instructions in this document and all other related documentation.

General Information

The control panel is a touch screen.

Meaning of Colors

- Red: Fault
- Yellow: Display of e.g. status, actual values. Also a warning in status line
- Green: Adjustable values: Input of e.g. setpoints/text or switched on
- Gray: Selection (with keys) is possible

Description of Symbols

The following symbols appear on several screens and indicate



Call up a help text



General information



ESC

Return to previous level. Cancel and close when in input windows



To next/previous screen



Confirmation, acceptance of a value



Backspace, delete



Page up/down



Setup



Master overwrite

Keys with and without Indication Lamp



The indication lamp indicates the status (lit = switched on). In this case: Heaters are switched on.

Fig. 4-1 Example

Input Window



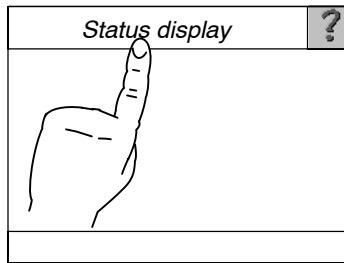
When a field for entering a numerical value is touched, this input window appears.

Fig. 4-2

When a field for entering a name is touched, this input window appears.

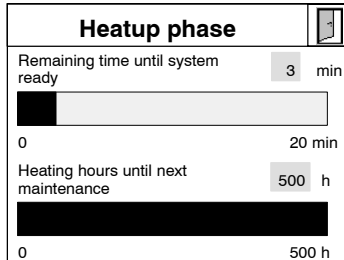


Status Display



Another screen is called up by touching the line *Status display*. The contents of the screen is a factor of the displayed status:

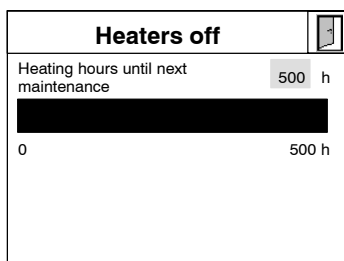
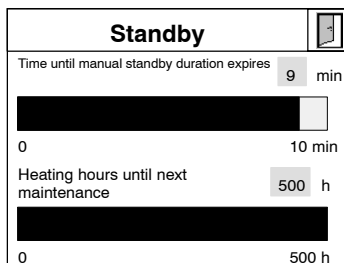
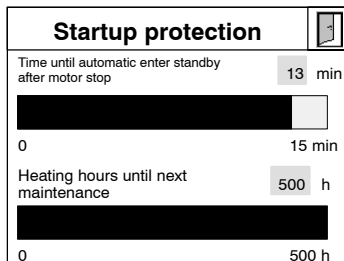
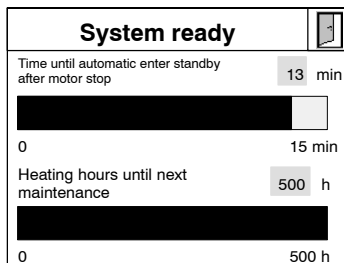
- Heatup phase
- System ready
- Startup protection or standby
- Motor running or heaters off.



By status

- Warning
- Fault
- Shutdown

the system moves directly to *Fault indications* (Refer to Fig. 4-29).



Initial Startup

After the melter has been properly installed, initial startup can take place.

The melter was subjected to extensive testing prior to shipment. In doing so, the tank was filled with a special test material. Material residue may still be present in the melter. To remove the residue, melt and feed several kilograms of material before starting production.

CAUTION: Do not operate Nordson gear pumps without material. Before switching on the motor, ensure that the tank is filled.

1. Set the main switch to I/ON.



Position I/ON = Melter switched on.



Position 0/OFF = Melter switched off.

Padlocks can be used to protect the main switch from being turned on by unauthorized personnel.

2. Wait until the starting screen appears on the control panel.

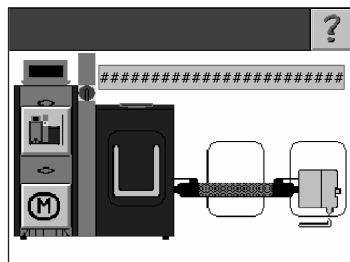


Fig. 4-3 Starting screen

NOTE: Do not touch or cover the screen during startup. Wait until it has completed the function test and the light tower lamp test and the starting screen appears.

Entering Password

If a password-protected input field is touched, the control unit causes the keypad and the input field for the password to appear.



Fig. 4-4

The default setting is two password levels with the following passwords:

- S Operator: 747
- S Engineer: 757

Change the passwords upon initial startup.

Also refer to *Siemens Manual TP 270, Password Protection*.

Initial Startup (contd.)

Set on Control Panel:

3. Basic settings

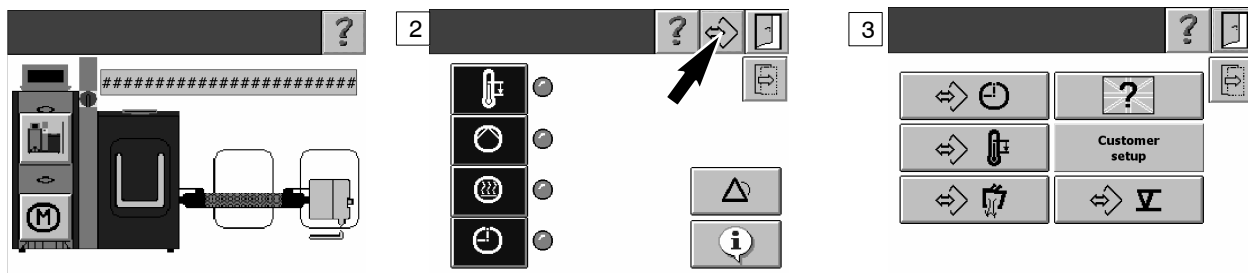


Fig. 4-5



Touch repeatedly until the starting screen reappears.

Control Panel Setup

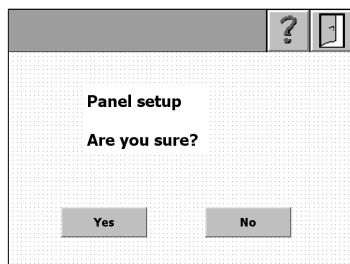


Fig. 4-6

NOTE: If the key is touched unintentionally, the following screen appears on the control panel.

- Reply NO and return to the program.

If YES is confirmed, the PLC begins the operating program again (restart/reboot). The operator must now wait until a screen appears that contains a key *F8*. The key must be pressed so that the starting screen is displayed again. This takes approx. three to five minutes.

Refer to the manual *Touch Panel TP 270* for more information.

- Temperature setpoints (= processing temperatures)

Refer to *Overview / T1*.

- Undertemperatures / overtemperatures

Refer to *Overview / T2*.

Control Panel Setup (contd.)

- Activate/deactivate channels
- Re-name temperature channels if necessary.

NOTE: Texts that the customer can change are not translated into the selected local language.

Refer to *Overview / T3*.

- Pump speed(s) in manual mode

NOTE: To prevent excessive wear, the motor/pump speed should not continuously fall below 5 min⁻¹ (rpm) or continuously exceed 80 min⁻¹ (rpm).

Refer to *Overview / M1*.

- If the melter is to be operated via the interface *Standard I/O*, change the motor enable from *Control panel* to *Control panel AND standard I/O*.

Refer to *Overview / M2*

- Key-to-line – settings

Refer to *Overview / M1 to M3*.

- Select temperature unit, °C (default) or °F
Select pressure unit, bar (default) or psi

Refer to *Overview / V15*

Initial Startup *(contd.)*

- Set service interval.

The service tasks that are to be indicated as well as the intervals must be stipulated. For recommended intervals refer to section *Maintenance*. The intervals may need to be adapted to the operating conditions.

Refer to *Overview / V16*

- Additional parameters, depending on model of melter.

4. Set seven-day clock.

Refer to *Overview / V8*

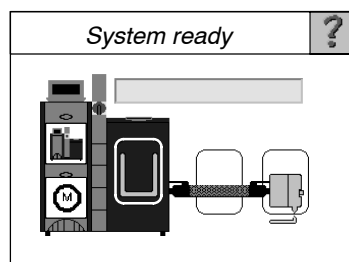


Fig. 4-7

5. Wait until the system is ready for operation.

6. Tighten the gland bolt on the pump(s) (Refer to section *Maintenance*).

7. Enable the motor(s).

8. Switch on the motor(s).

Refer to *Overview / M1* and *V1* and Figure 4-28.

Control Panel – Overview –

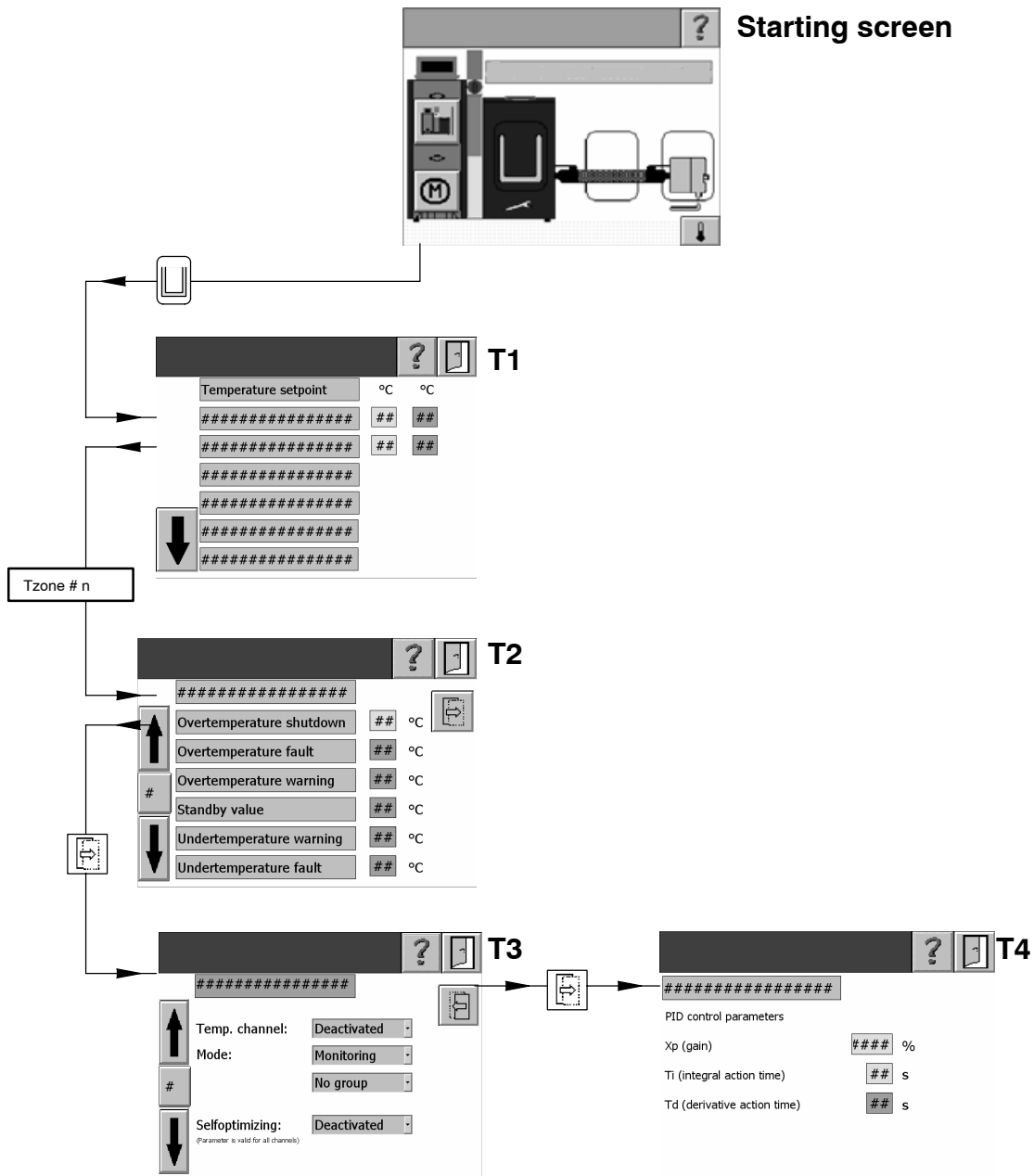


Fig. 4-8

Note: The feature *Self-optimization* is available only with melters that have *ETR* temperature controllers. The menu *T4* is not available with melters that have *ETR* temperature controllers.

Control Panel – Overview – (contd.)

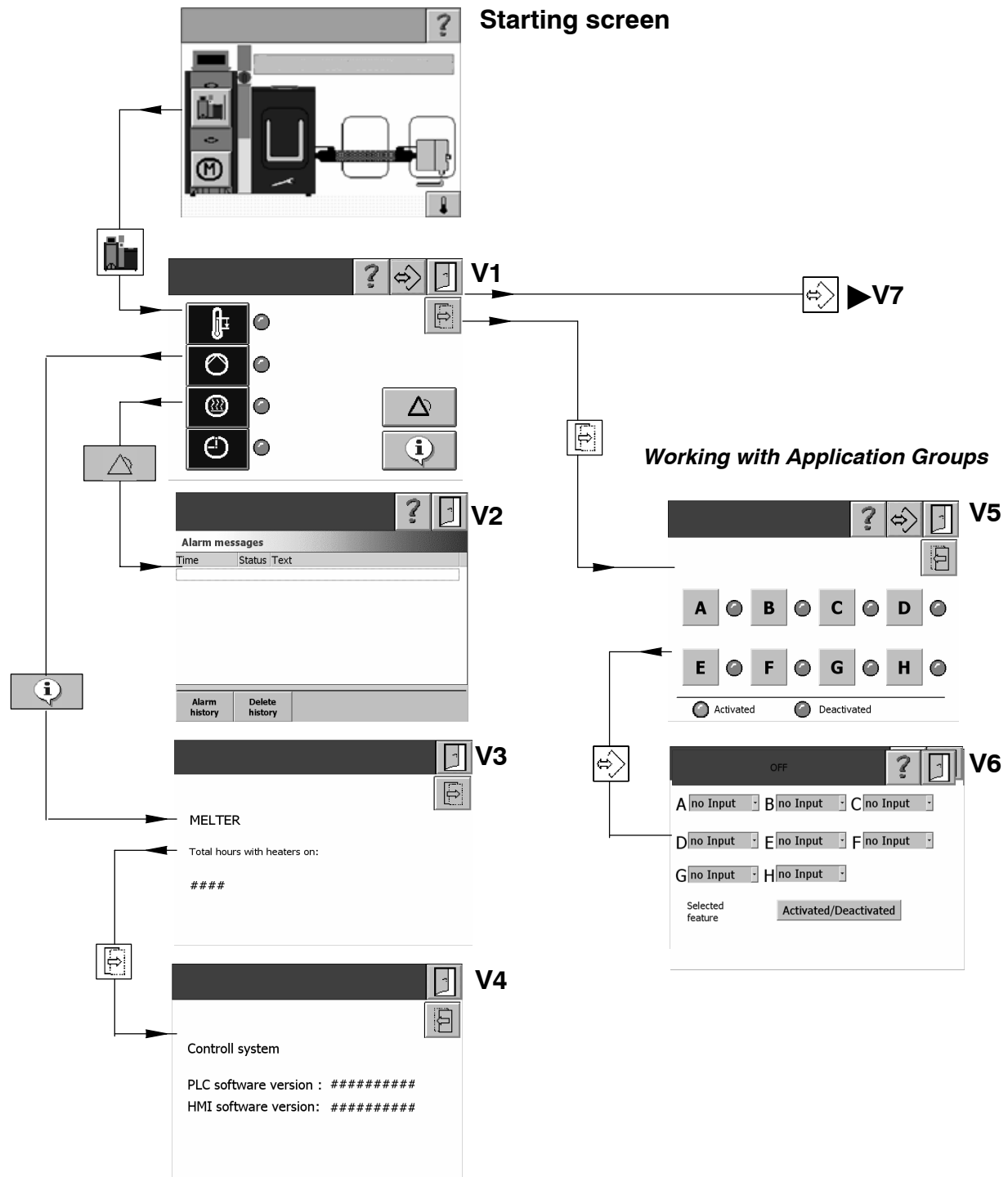


Fig. 4-9

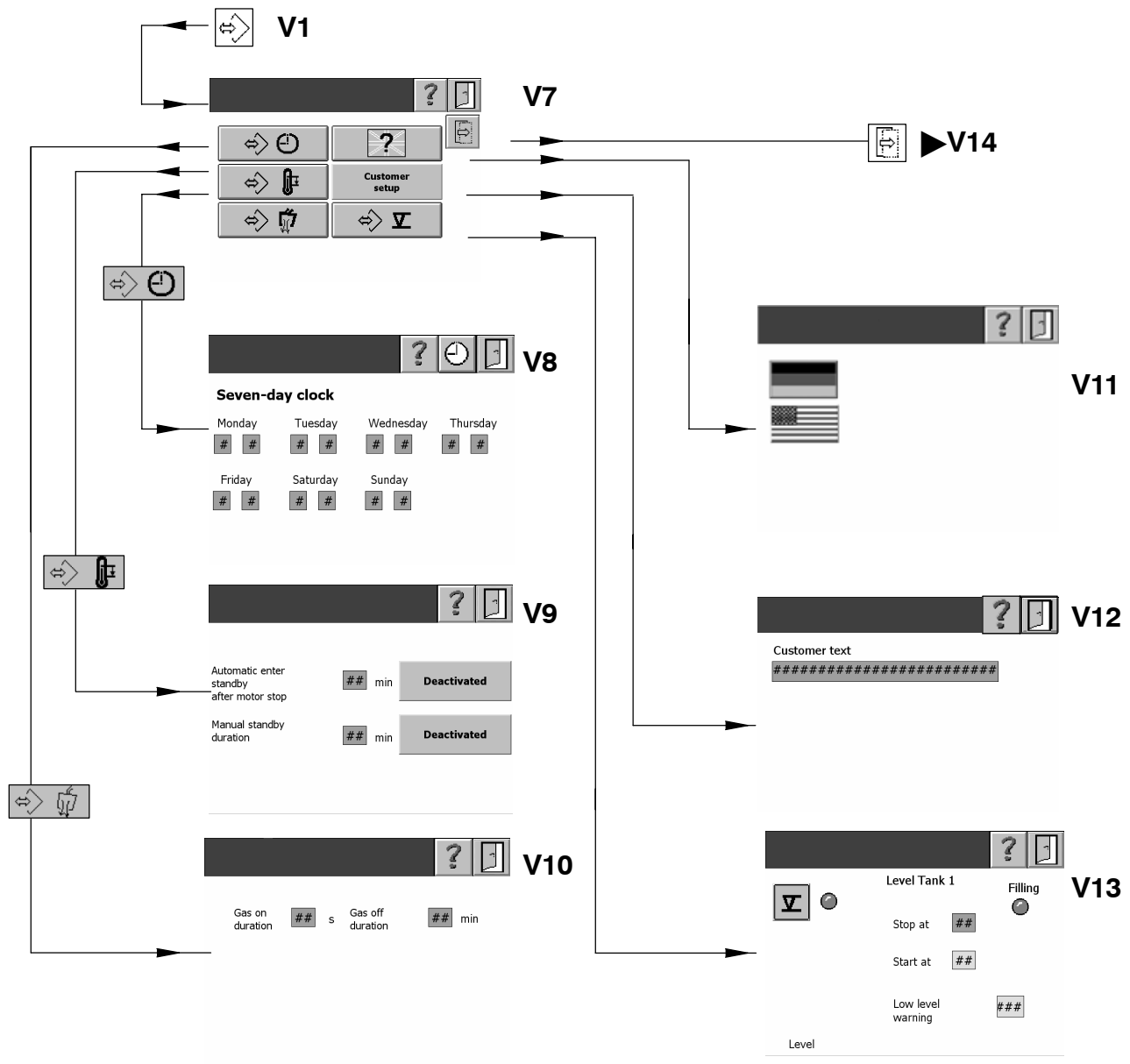
Control Panel – Overview – (contd.)

Fig. 4-10

Control Panel – Overview – (contd.)

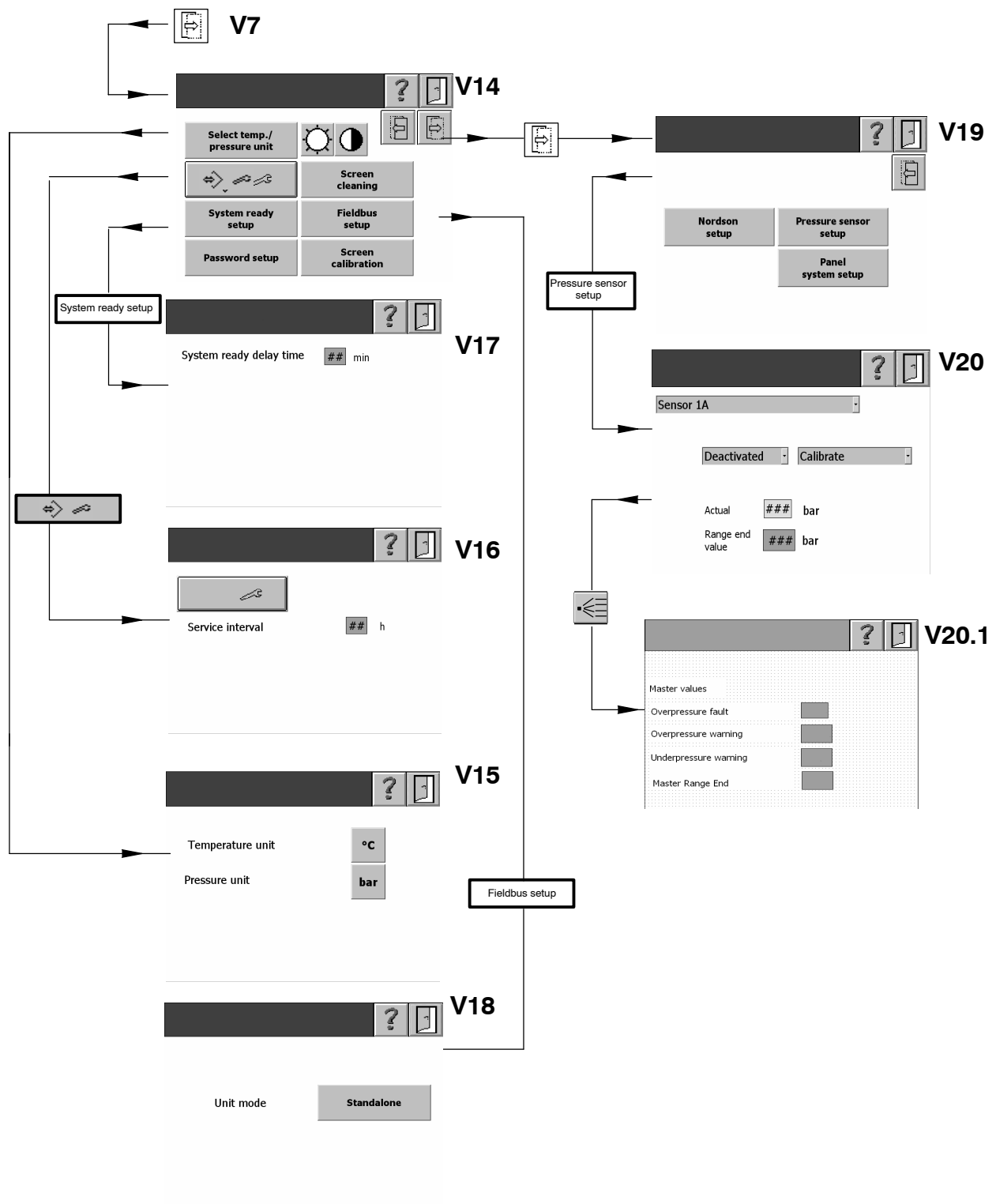


Fig. 4-11

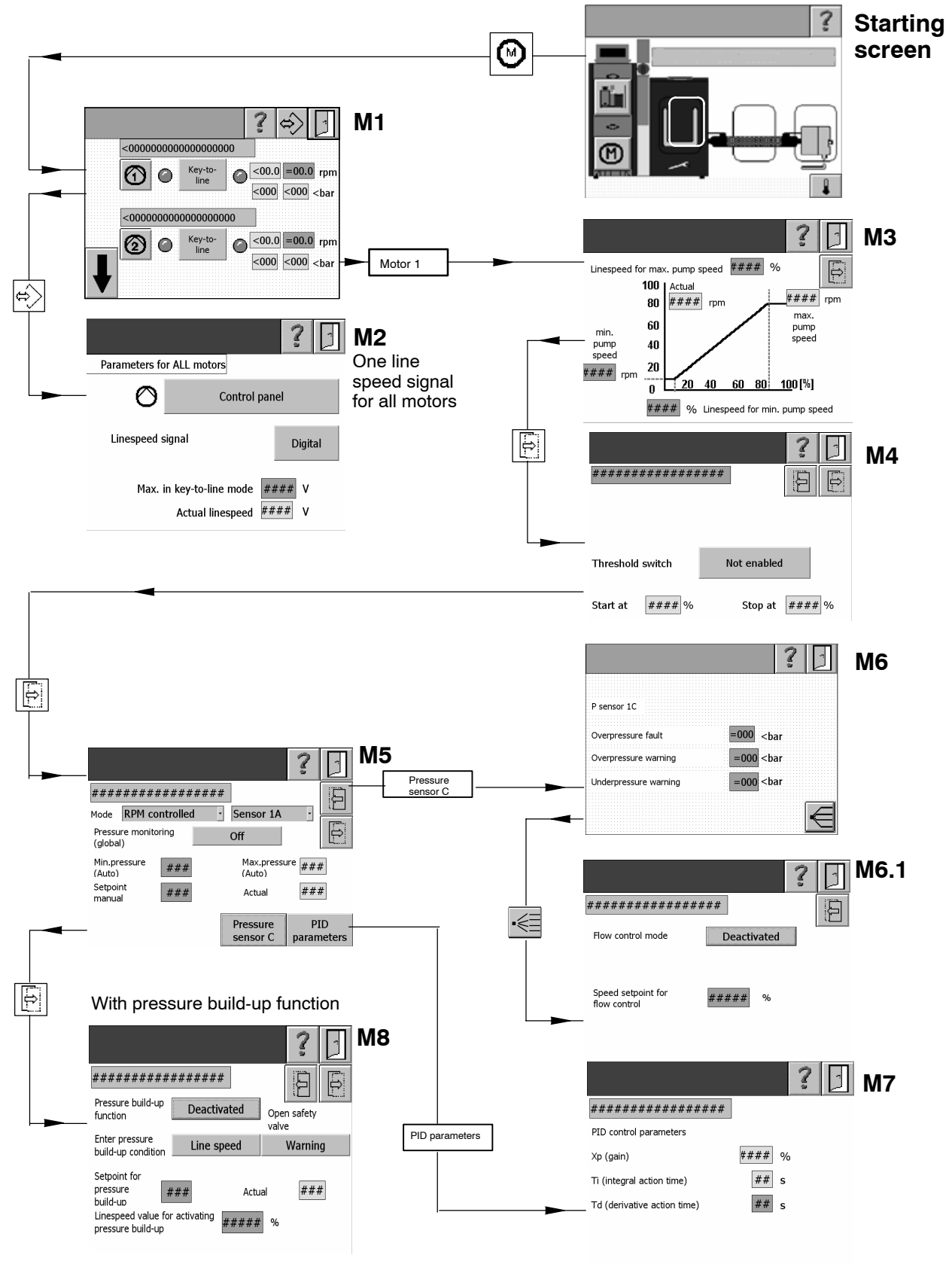
Control Panel – Overview – (contd.)

Fig. 4-12

Filling the Tank

Manually



WARNING: Hot! Risk of burns. Wear appropriate protective clothing/equipment. Tank and tank lid are hot. When filling, hot material may splash out of the tank. Use caution when filling tank with material.



CAUTION: Do not operate melter with open tank. When the tank is open, hot material vapors can escape; vapors may contain potentially hazardous substances.

CAUTION: Before filling the tank, ensure that the tank and material are clean and free of foreign substances. Foreign substances can hinder functioning or even cause damage to the melter or accessories.

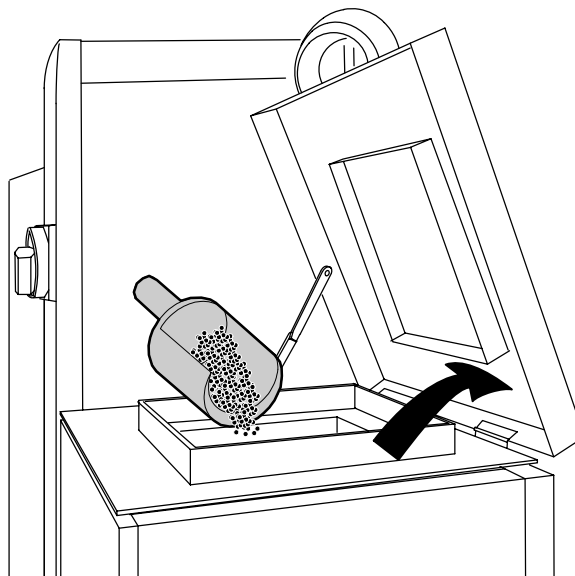


Fig. 4-13

CAUTION: Cease operation before the tank is completely empty. If there is too little material in the tank, the material can overheat. Overheated material can char, collect on surfaces and cause malfunctioning.

Maximum Level

The level should not exceed 25 mm (1 inch) under the rim of the tank (max1).

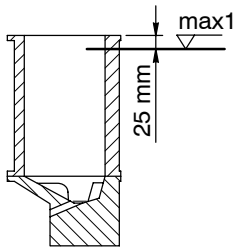


Fig. 4-14 Cross-section of tank

Automatic (Option)

Automatic tank filling is performed e.g. by a bulk melter connected to the optional filling valve with a hose. Level sensors in the tank start and stop the filling process.

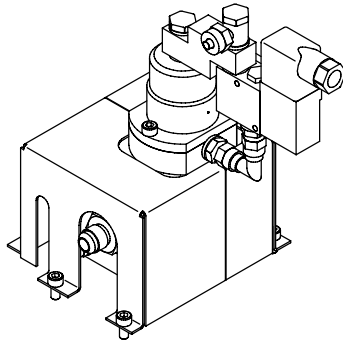


Fig. 4-15 Filling valve

Recommended Temperature Setpoints

The temperature setting is determined, among other things, by the processing temperature prescribed by the material supplier.

CAUTION: Nordson will grant no warranty and assume no liability for damage resulting from incorrect temperature settings.

Grid	Up to 20 °C (36 °F) below prescribed processing temperature
Reservoir (high melt)	Prescribed processing temperature (Material quantity used <50 g/min: 0 to 10 °C (18 °F) below prescribed processing temperature)
Undertemperature value (warning)	10 °C (18 °F) below set processing temperature Air heater: approx. 10 °C (18 °F) below set processing temperature
Undertemperature value (fault)	15 °C (27 °F) below set processing temperature Air heater: approx. 20 °C (36 °F) below set processing temperature
Overtemperature value (warning)	10 °C (18 °F) above set processing temperature Air heater: approx. 10 °C (18 °F) above set processing temperature
Overtemperature value (fault)	15 °C (27 °F) above set processing temperature Air heater: approx. 20 °C (36 °F) above set processing temperature
Filling valve (option)	Prescribed processing temperature*
Gun (accessory)	Prescribed processing temperature(s)*
Hose (accessory)	Prescribed processing temperature*

* **CAUTION:** The maximum operating temperature of the installed gun and the other heated system components should be considered when setting temperatures on the melter control panel. Refer to *Overview / T1* for information on input.

Heatup Guided by Reference Channel

NOTE: All activated channels in control mode are included in the heatup guided by reference channel, including those assigned to an activated application group.

After every switchon and after standby is exited, the melter returns to *Heatup phase* (status display).

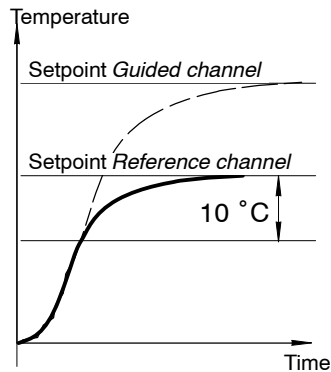


Fig. 4-16

Heatup guided by reference channel prevents individual temperature channels from reaching their setpoint temperature long before the slowest temperature channel (reservoir/high melt = reference channel). It prevents hot melt material from charring in hoses/guns and the build-up of material expansion pressure during heatup. It also helps to save energy.

The actual reservoir temperature serves as the current temperature setpoint for the guided channels until the reservoir has reached a temperature of 10 °C (18 °F) below its setpoint temperature. Then heatup guided by reference channel ends automatically. This way all channels reach their setpoint temperatures more or less at the same time.

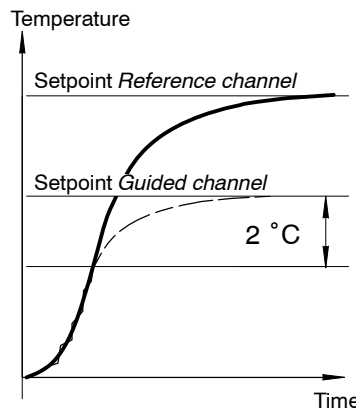


Fig. 4-17

When the current temperature setpoint of a guided channel (= current value of reservoir/high melt) reaches the guided channel's own setpoint minus 2 °C (3.6 °F), it is excluded from heatup guided by reference channel and then heats to its own setpoint independently (Refer to Fig. 4-17).

Undertemperature Interlock

The undertemperature interlock prevents the melter motors from being switched on as long as the material is too cold and thus too thick. This could damage the pumps.

The undertemperature interlock is active during every *Heatup phase* (status display) and after every standby. Also refer to section *Troubleshooting, Undertemperature Fault Triggered*. If the system ready delay time is activated, this time must also have expired before the interlock is disabled.

Motor Startup Protection

The motor startup protection prevents the motors from starting up on their own after heatup or after a fault. The melter goes to startup protection if at least one motor was running before heatup or before the fault occurred.

Condition for *Motor running*: **All motors ON and Enable motor**

When the system is ready again (status display), the motors can be switched on again via the control panel or the interface *Standard I/O*.

Acknowledge Startup Protection

On the Control Panel



Press the key *Switch on/off all motors (collective enable)*; startup protection is acknowledged and all enabled motors run again.

Via Interface Standard I/O

Switch *All motors ON/OFF* from OFF to ON. All enabled motors run again.

Via Field Bus

Set *All motors ON/OFF (collective enable)*. (rising edge; refer to *Melter control*: If bit 1 = 0, then set to 1. If bit 1 = 1, set to 0 then back to 1). All enabled motors are running again.

Daily Startup

NOTE: The following steps can be performed completely only with a level 1 password.

1. Set the main switch to I/ON.
2. If the heater is switched off, the  key may need to be touched. The melter begins to heat up.

CAUTION: Do not operate Nordson gear pumps without material. Before switching on the motor, ensure that the tank is filled.

3. Fill the tank if necessary.
4. Wait until the system is ready for operation (green status display *System ready*).
5. Enable the motor(s). Refer to Fig. 4-28.
(Refer to *Overview / M1*)

NOTE: To prevent excessive wear, the motor/pump speed should not continuously fall below 5 min⁻¹ (rpm) or continuously exceed 80 min⁻¹ (rpm).

6. Switch on the motor(s). Refer to Fig. 4-28.

Daily Switchoff

1. Switch off the motor(s).
2. Set the main switch to 0/OFF.
3. If necessary, secure the main switch with padlocks against unauthorized access.

Switching Off in an Emergency



WARNING: Switch off the melter immediately in any emergency situation.

1. Set the main switch to 0/OFF.
2. After standstill and before switching the melter on again, have the emergency situation remedied by qualified personnel.

TP 270 Control Panel

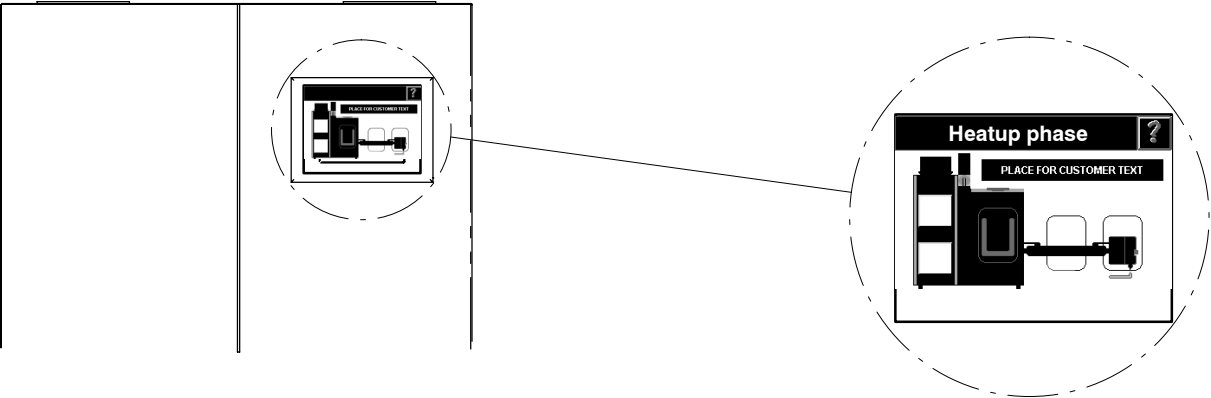


Fig. 4-18

Melter Modes – Overview

V25, V50, V 100	
⇒ Local mode ⇒ Speed control • Manual mode • Key-to-line ⇒ Pressure control • Manual mode • Key-to-line	⇒ Field bus mode ⇒ Speed control • Manual mode • Key-to-line ⇒ Pressure control • Manual mode • Key-to-line

Starting Screen

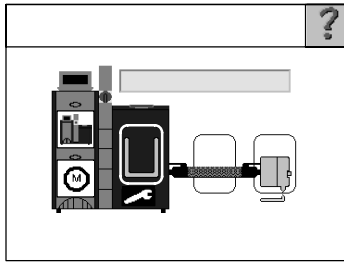


Fig. 4-19

 **Service symbol:** A wrench lights up. Refer to *Overview / V16*.

Additional screens are called up by pressing these symbols:



Move to the screen in which the setpoints can be entered for all temperature channels (Refer to *Overview / T1*).



Move to melter screens



Move to motor screens



Temperature Parameters

CAUTION: The maximum operating temperature of the installed gun and the other heated system components should be considered when setting temperatures.

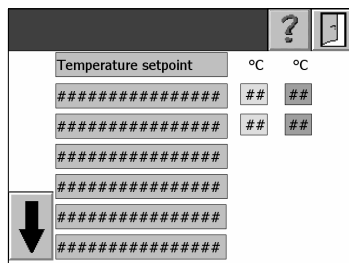


Fig. 4-20 T1

Left temperature column (yellow): Actual values
Right temperature column (green): Setpoints

NOTE: A channel is deactivated if the respective actual values are 0 (zero).

 Grid and reservoir: 175 °C (347 °F)

 Hose 1 / Gun 1: 175 °C (347 °F)

 All other channels: 40 °C (100 °F)

**Example: Increasing Temperature of Hose 1
from 220 °C (428 °F) to 230 °C (446 °F)**

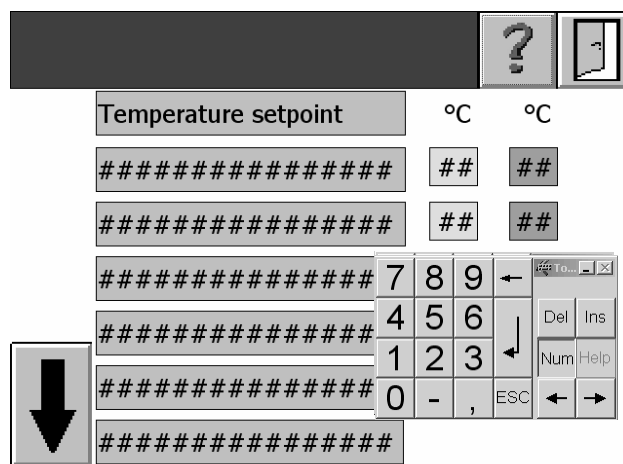


Fig. 4-21

1. Touch the green field 220 °C in the right temperature column (setpoints).
2. Enter 230 in the input window and confirm with .

Example: Increasing Temperature of Hose 1 from 220 °C (428 °F) to 230 °C (446 °F) (contd.)

Select the desired temperature channel to access the parameter level.

NOTE: To be able to work on the parameter level, the password for level 2 (trained personnel) must first be entered.

For information on changing a name to your local language (e.g. Hose 1 to XYZ 1), refer to *Overview / T3*.

Grid

Parameters (Screen 1: Alarm Values)

NOTE: To be able to work on the parameter level, the password for level 2 (trained personnel) must first be entered.

NOTE: The temperatures in this screen are differential values.

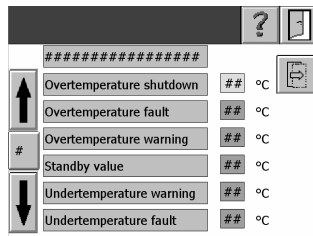


Fig. 4-22 T2

Standby temperature =	Setpoint temperature – Standby value
-----------------------	---

NOTE: The minimum standby temperature is 40 °C (100 °F), even if the selected settings would (mathematically) permit the standby temperature to be lower.

 Standby value: **50 °C** (90 °F)

Warning <i>Overtemperature</i> =	Setpoint temperature + Overtemperature warning delta
Warning <i>Undertemperature</i> =	Setpoint temperature – Undertemperature warning delta

NOTE: The warning value is a factor of the fault value in that the values for the warning may not be larger than the corresponding values for the faults. When appropriate, first increase the fault value.

 Overtemperature/undertemperature warning: **5 °C** (10 °F)

Fault <i>Overtemperature</i> =	Setpoint temperature + Overtemperature fault delta
Fault <i>Undertemperature</i> =	Setpoint temperature – Undertemperature fault delta

Grid

Parameters (Screen 1: Alarm Values) *(contd.)*



Overtemperature/undertemperature fault: **10 °C** (18 °F)

Overtemperature shutdown =	Setpoint temperature + (Overtemperature fault delta + 10 °C) Setpoint temperature + (Overtemperature fault delta + 20 °F)
----------------------------	--

NOTE: The overtemperature shutdown is calculated and therefore can not be changed.

Example

Setpoint temperature = 170 °C (338 °F),
Overtemperature fault = 60 °C (108 °F)

This results in

Fault *Overtemperature* at 230 °C (446 °F)
Overtemperature shutdown at 240 °C (466 °F).

During operation the operator increases the setpoint to 190 °C (374 °F); the value *Overtemperature fault delta* is left unchanged. Mathematically, an overtemperature fault indication would then occur at 250 °C (482 °F). However, shutdown occurs at a fixed value of 245 °C (475 °F).

Graphic Presentation of Temperature Parameters

*Refer to *Monitoring of Heatup and Cooling*

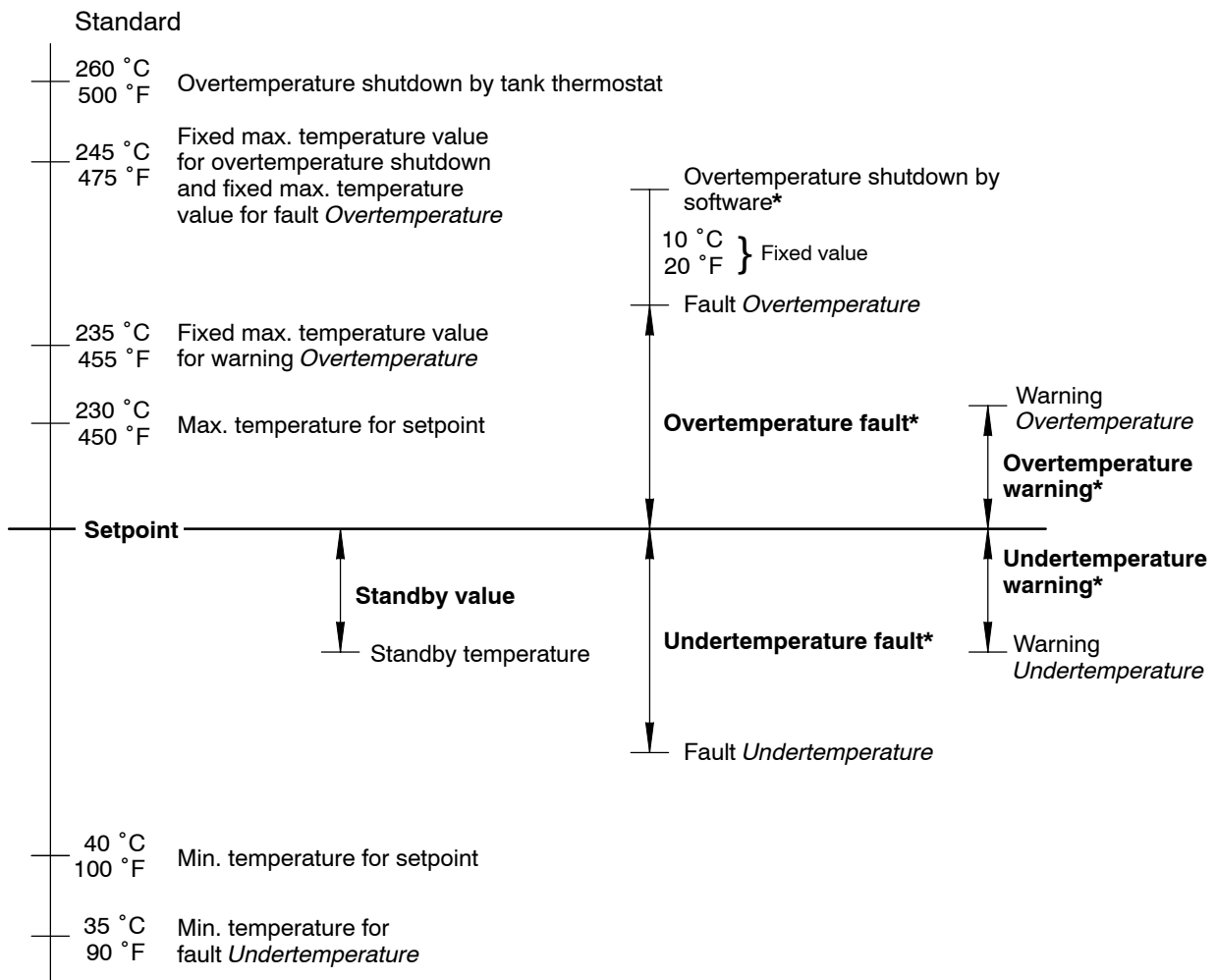


Fig. 4-23



Parameters (Screen 2: Activate Channel, Mode, Control Parameters)

NOTE: To be able to work on the parameter level, the password for level 2 (trained personnel) must first be entered.



The  keys can be used to select a certain temperature zone.

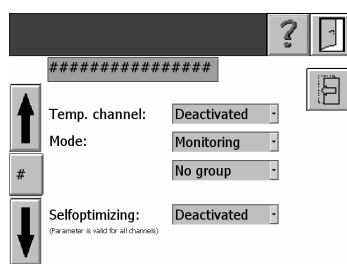


Fig. 4-24 T3

Temperature Channel: Select Deactivated / Activated

Not activated (deactivated)

A deactivated channel is not heated. Temperature control and monitoring for faults do not take place. Exception: Overtemperature shutdown at a set temperature value of 245 °C (475 °F).

Activated

Normal state of a channel during operation. Activated channels can be switched to display or control mode.

NOTE: Temperature channels for reservoir and grid can not be deactivated.



Not activated

Mode: Select Display Mode (Monitoring) or Control Mode

Display mode

In *Display mode* only the measured temperature is displayed. Temperature control and monitoring for faults do not take place. Exception: Overtemperature shutdown at a set temperature value of 245 °C (475 °F).

NOTE: Temperature channels for reservoir and grid as well as grouped channels can not be switched to display mode.

Control mode

A PID control algorithm is used for the selected control parameters in control mode.



Control mode



Parameters (Screen 3)

NOTE: To be able to work on the parameter level, the password for level 2 (trained personnel) must first be entered.

#####

PID control parameters

Xp (gain) ### %

Ti (integral action time) ## s

Td (derivative action time) ## s

Control parameters

The PID control parameters can be selected as desired in this screen.

NOTE: Should be adjusted only by personnel with experience in metrology and control technology.

NOTE: The I-component can be deactivated with the value 0.

Fig. 4-25 T4

Assigning Temperature Channel to a Group

Defining Groups

All temperature channels (except for grid and reservoir) can be combined to application groups *Group A* to *Group H*. Channels not assigned to any group belong to *No group*.

Of the eight possible application groups, four can be switched via the control panel as well as via the interface *Standard I/O*; the others can be switched only via the control panel (Refer to *Standard I/O Group Inputs*).

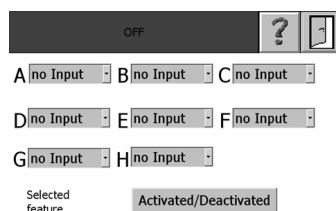
Example:

1. Select temperature channel.
2. Select group letter, e.g. *Group A*.

A different group letter can be selected by repeatedly pressing the group key.

If several temperature channels are to be combined to one group:

1. Select temperature channel.
2. Select desired group.



Standard I/O Group Inputs

Input: An input (for enabling) can be assigned to each application group.

The desired input for the application group is selected by pressing the key repeatedly.

Fig. 4-26 V6

No input: These application groups can not be switched via the interface *Standard I/O*. These groups must be switched by the operator via the control panel or via the field bus.

Select Feature

Deactivated: The temperature channels assigned to a deactivated application group are not heated.

Temperature control and monitoring for faults do not take place. Exception: Overtemperature shutdown at a set temperature value of 245 °C (475 °F).

Standby: The temperature channels in this application group are lowered by the standby values set in the temperature parameter screen (Refer to Fig. 4-22).



Melter

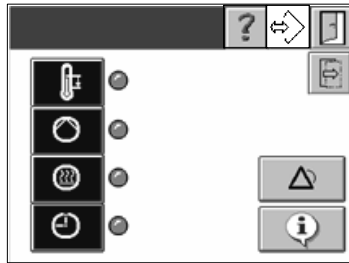


Fig. 4-27 V1



Entering/Exiting Standby

Refer to *Overview / V9* for information on standby setup.



Switching On/Off All Motors (Collective Enable)

Also refer to *Motor Startup Protection*.

Only enabled motors can be switched on. Prerequisite: The system is ready for operation (green status display *System ready* and green indication lamp on optional light tower lit).

Enabling

If there is no individual enable, the motors are enabled with the key *Switch all motors on/off (collective enable)* and via the interface *Standard I/O*.

Switching on

If there are individual enables, the motors are switched on with the key *Switch all motors on/off (collective enable)* and via the interface *Standard I/O*.

The indication lamp in the key can be different colors (Also refer to M2 *Motor enable*):

Gray (off):	No collective enable on control panel
Green:	Collective enable on control panel

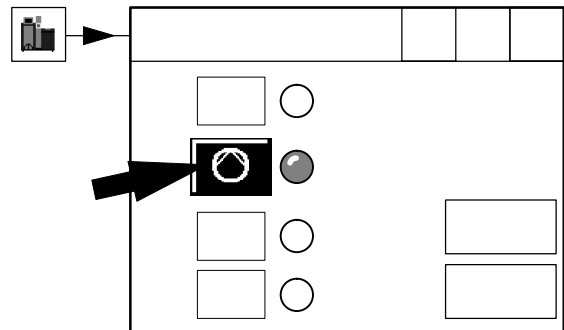
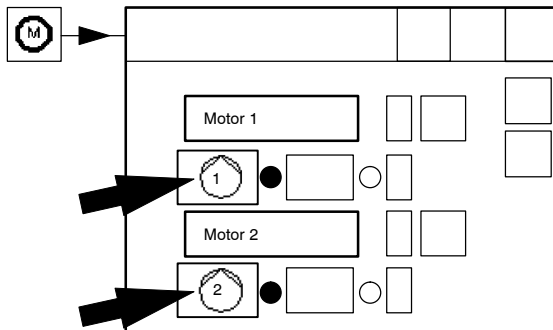


Fig. 4-28 Motor(s): Enable on the motor screen – switch on on the melter screen

**Melter** (contd.)

NOTE: The *Standard I/O* interface signals *All motors ON/OFF* (collective enable) and *Enable motor* can be deactivated with a key. The motors can then only be enabled and switched on via the control panel (Refer to Fig. 4-49 *Motor enable*).



Switching On/Off Heaters

The heaters can be switched on via the control panel, the interface *Standard I/O*, the seven-day clock, or in *Field bus* mode via the field bus. The main switch must be set to I/ON.

The main contactor closes. The power supply to heaters and motors is switched on. The heatup phase begins.

NOTE: When the heaters have been switched off, the control unit continues to be supplied with voltage, so the heaters can be switched on at any time via the seven-day clock.

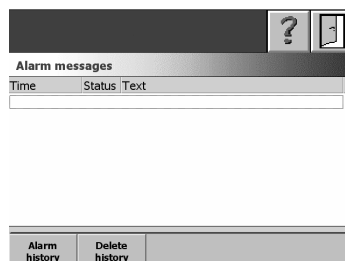


Switching On/Off Seven-day Clock

Refer to *Overview / V8*



Alarm Log



If this feature is activated, a list of the alarms appears.

Delete history:	Deletes all alarms
ACK:	Reset fault indication after the cause of the fault indication has been remedied.

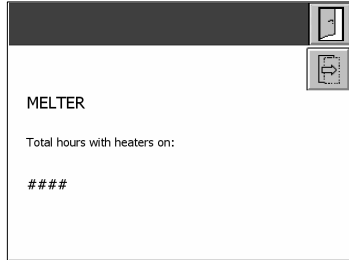
Fig. 4-29 V2



Melter (contd.)

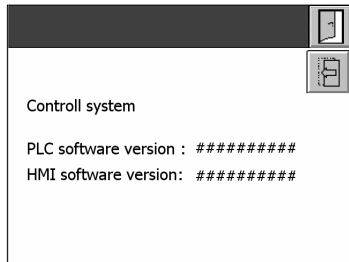


Information (Melter and Control System)



Total hours with heaters on: This value indicates the hours that the heaters were switched on.

Fig. 4-30 V3



This screen indicates the software versions used.

PLC software vers.	Version of control system software X.YYY (example: 1.200)
HMI software vers.	Version of control panel software X.YYY (example: 1.200)

Fig. 4-31 V4

Working with Application Groups

NOTE: To be able to work on the parameter level, the password for level 2 (trained personnel) must first be entered.

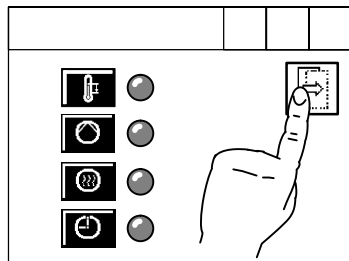


Fig. 4-32 V1

If no application groups have been established yet, proceed in this order:

1. Select standard I/O group inputs if groups are to be switched via the interface.
2. Select feature (*Deactivated* or *Standby*)
3. Switch application group(s).



Switch Application Group(s)

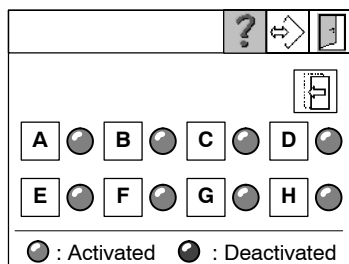


Fig. 4-33 V5

Temperature channels (except for grid and reservoir) can be combined to application groups A to H (Refer to *Defining Groups*).

The indication lamp shows whether the application group is activated (green) or whether the application group is deactivated or in standby (gray). Touch key to switch between activated and deactivated/standby.

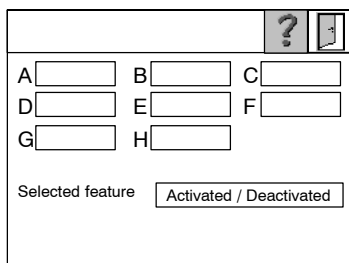


Fig. 4-34 Deactivated

The feature *Deactivated* or *Standby* can be selected in the setup screen. The selection is valid for all application groups.

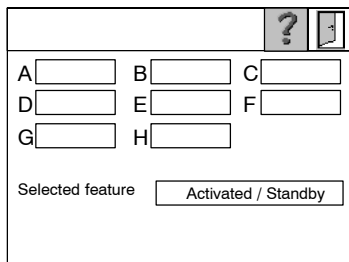


Fig. 4-35 Standby

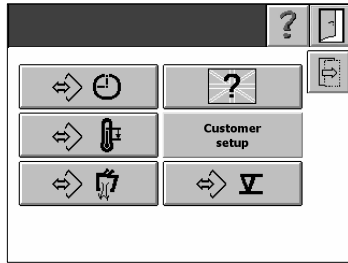
**Melter** (contd.)

Fig. 4-36 V7

**Setup (Screen 1: Seven-day Clock, Standby, Level)**

NOTE: To be able to work on the parameter level, the password for level 2 (trained personnel) must first be entered.

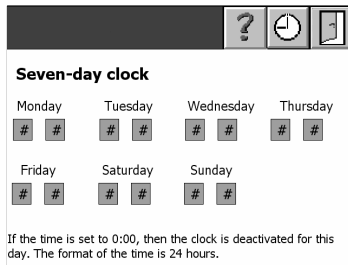


Fig. 4-37 V8

**Seven-day Clock**

Heaters can be switched on via the seven-day clock. For that purpose, enter a starting time for every day of the week.

If 0:00 is entered as the starting time, the seven-day clock is deactivated for that day.

NOTE: The switching times are entered in 24-hour format.

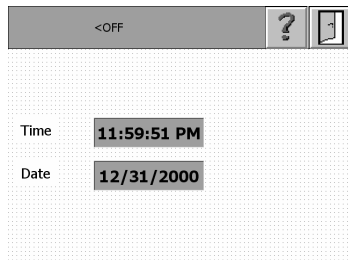
Set Date / Time

Fig. 4-38

The current date and time are set before the melter is delivered. However, both can be changed in the control panel setup.

Refer to the manual *Touch Panel TP 270* for more information.

NOTE: The time is not automatically changed to and from daylight savings time.



Fig. 4-39 V12

Customer Setup

Text can be entered that will appear on the starting screen, e.g. adhesive type used in the production line.

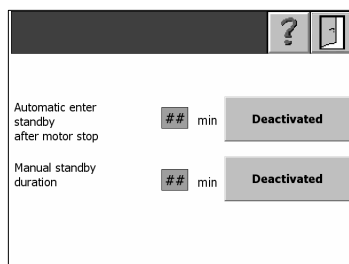


Fig. 4-40 V9

Standby

Standby serves to protect the hot melt material and to save energy during breaks in production.

For information on setting the temperature standby value (value by which the setpoint temperature is reduced), refer to *Overview / T2*.

Automatic Entry

Standby is entered as soon as all of the motors have been stopped for a certain time. Enable *Automatic enter standby* for this purpose.

Manual Exit

Automatic standby is exited by the operator on the control panel .

Manual standby duration is ineffective here.



Automatic enter standby after motor stop: **60 min**

Manual Entry/Exit (Control Panel) External Entry/Exit (Interface)

Either the operator enters and exits standby on the control panel, key , or this occurs via the interface *Standard I/O*.

Automatic Exit

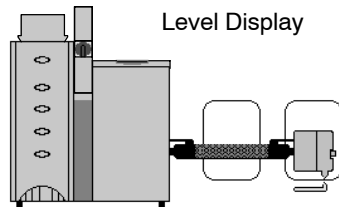
Exit standby can also occur automatically. Enable *Manual standby duration* for this purpose. After the set time has expired, the melter automatically returns to heatup guided by reference channel.



Manual standby duration: **60 min**

Entering/Exiting via the Seven-day Clock

Refer to *Overview / V7* and *V8*.

**Melter** (contd.)**Level (Option)**

Level Display

If the melter is heated up and there are no undertemperature faults or sensor alarms (short-circuit / sensor break), the command to fill is given as soon as the level reaches or falls below the value *Start at*.

Filling continues until the level has reached or exceeded *Stop at*. All values are shown as a percentage of the tank volume.

The status diode is lit during filling.

Activate and Deactivate Level Control

Level control is activated and deactivated by pressing .

Level display and monitoring no longer occur when level control is deactivated. Now the tank can be emptied for maintenance or repair work without the fault *Tank empty* occurring.

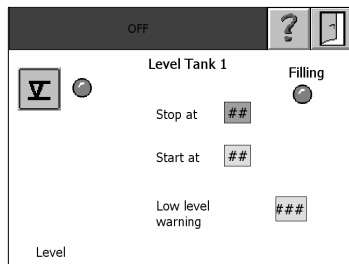


Fig. 4-41 V13



Start at: **10 %**



Stop at: **80 %**



Low level warning: **10 %**

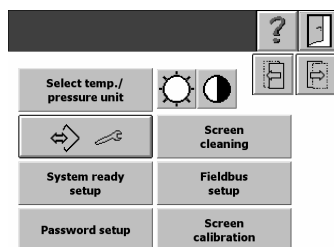


Fig. 4-42 V14



Setup (Screen 2: e.g. Units, Ready Delay Time, Service Interval, Field Bus)

NOTE: To be able to work on the parameter level, the password for level 2 (trained personnel) must first be entered.

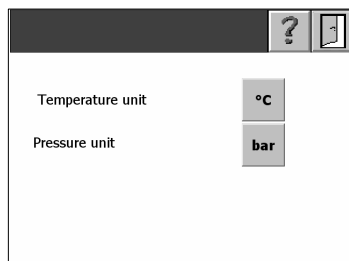


Fig. 4-43 V15

Select Temperature/Pressure Units

Either °C or °F can be selected as the temperature unit.



°C



bar

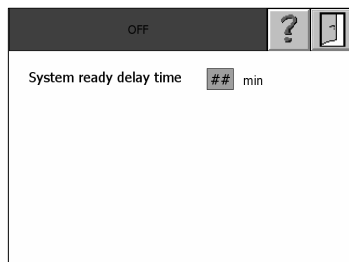


Fig. 4-44 V17

System Ready Setup

The system ready delay time is the time after which all components have reached their setpoint temperatures and before the system indicates readiness. This additional time allows the material to reach a thermally homogenous state.

The system ready delay time, if activated, runs after every *heatup phase* (status display).



0 min

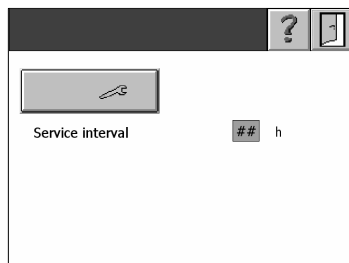
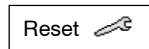


Fig. 4-45 V16



Service Interval Setup

When the *Service interval* time defined by the customer has expired, the service symbol (open-jawed wrench) lights up on the starting screen. The symbol can be used e.g. to signal that the filter needs to be changed.



Reset

The time for the service interval is reset, and the service symbol is switched off.



500 h (total hours with heaters on)



Melter (contd.)

Field Bus Setup

The melters on the field bus each require a node address for communication; each address may be assigned only once in the entire field bus.



10

NOTE: The node address may be changed with the software *SIMATIC STEP7* only by personnel with PLC training.

Switching Between Field Bus Mode and Local Mode

Field bus mode:

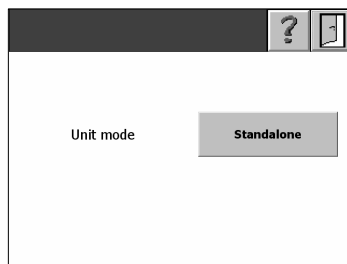
- Control access only from host
- Parameter input only via host
- On the control panel, all parameters can be displayed but not changed. Actual values are shown on the control panel.

Local:

- Control access only from control panel and by control signals from the external interfaces
- Parameter input only via control panel
- On the host, all parameters can be displayed but not changed. The host can read actual values.



Local



Selecting Communication Mode

This menu is used to select the type of communication between the customer's PLC and the melter.

Also refer to *Communication Data List*.

Fig. 4-46 V18

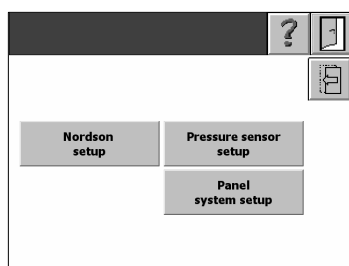


Fig. 4-47 V19

Setup (Screen 3: e.g. Nordson Setup, Pressure Sensor Setup)

NOTE: To be able to work on the parameter level, the password for level 2 (trained personnel) must first be entered.

NORDSON Setup

Only for Nordson employees with the Nordson password.

Pressure Sensor Setup

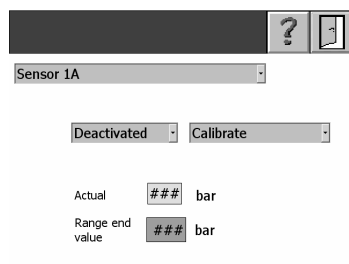
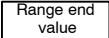


Fig. 4-48 V20

The  keys can be used to select a certain pressure sensor.

NOTE: Pressure sensor A is always located at the melter outlet, behind the filter cartridge (default). With the option *Pressure display and pressure control*, it transmits the values to the motor controller.

NOTE: To calibrate the sensor, the melter must be heated to processing temperature and may not be pressurized (relieve pressure if necessary; refer to section *Installation*).

1.  Perform nullification. Nullification should be performed even if 0 bar is displayed as the actual value; internal calibration is more precise.
2. Activate connected pressure channels, thus enabling the pressure display.
3.  The pressure limit for every pressure sensor must be entered for the correct pressure to be displayed.

Master Overwrite (Pressure)

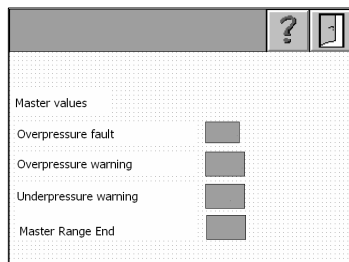


Fig. 4-49 V20.1

The master overwrite  key offers a way to enter all alarm values only once and have them apply for all pressure channels.

Motor

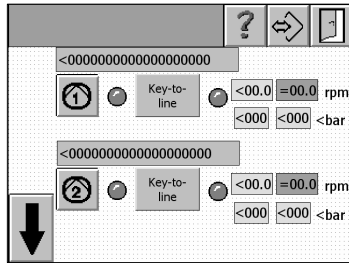


Fig. 4-50 M1: Mode *Speed control* with pressure display



Switching On/Off Motor (Individual Enable)

Only enabled motors can be switched on. Prerequisite: The system is ready for operation (green status display *System ready* and green indication lamp on optional light tower lit).

rpm: revolutions per minute

Enabling

If there is no collective enable, the individual motors are enabled with the key *Switch motor on/off (individual enable)* and via the interface *Standard I/O* with the signal *Enable motor*.

Switching On

If there is a collective enable, the individual motors are switched on with the key *Switch motor on/off (individual enable)* and via the interface *Standard I/O* with the signal *Enable motor*.

The indication lamp in the key can be different colors:

Gray (off):	No motor enable on the control panel
Green:	The motor is enabled on the control panel

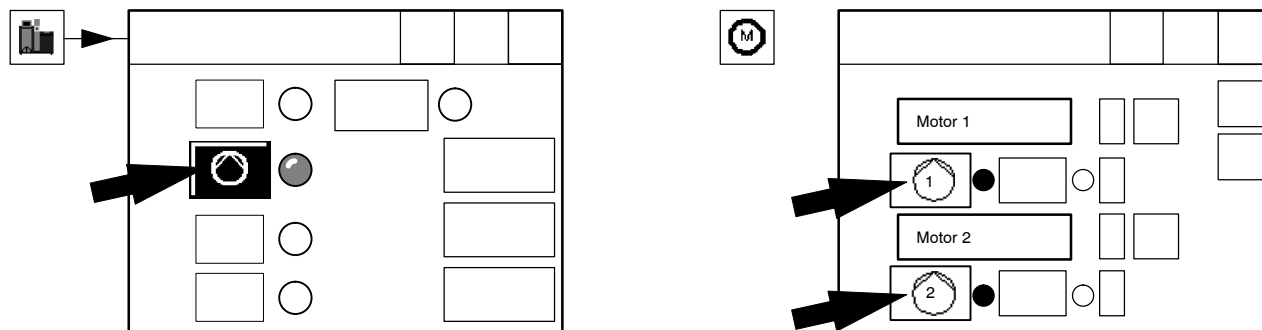
 Motor (contd.)


Fig. 4-51 Motors: Enable on the melter screen – switch on via the motor screen

NOTE: The *Standard I/O* interface signals *All motors ON/OFF (collective enable)* and *Enable motor* can be deactivated with a key. The motors can then only be enabled and switched on via the control panel (Refer to Fig. 4-52 *Motor enable*).

Key-to-
line

Selecting Key-to-line or Manual Mode

In manual mode the motor runs at the set speed; in key-to-line it runs at the speed determined by the line speed signal value.

Key-to-line mode: Indication lamp lit.

Manual mode: Indication lamp not lit.



Motor (contd.)

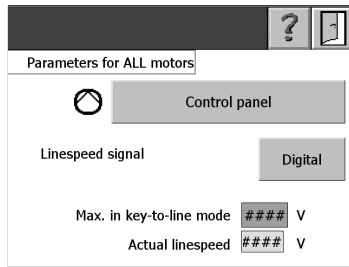


Fig. 4-52 M2



Parameters (Screen 1: Type of Motor Enable, Adaptation to Parent Machine)

NOTE: To be able to work on the parameter level, the password for level 2 (trained personnel) must first be entered.

Motor Enable Via Control Panel / Control Panel AND Standard I/O

Control panel: The *Standard I/O* interface signals *All motors ON/OFF* (*collective enable*) and *Enable motor* are deactivated. The motors can then only be enabled and switched on via the control panel.

In this case the melter can function even without a standard I/O connection to the parent machine, e.g. if it is to be purged for maintenance purposes.



Enable motor via **Control Panel**

Line Speed Signal

Either *analog* or *digital* (pilot voltage via bus) can be selected.

Max. in Key-to-line Mode

For calibration with the signal received from the parent machine.

Example: The parent machine runs at maximum speed. An input signal of 9.8 V (*actual* value) is displayed. Then set *Max. in key-to-line mode* to 9.8 (applies only to analog signal).

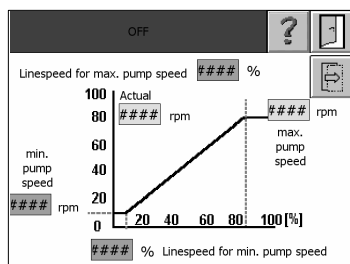


Fig. 4-53 M3



Parameters (Screen 2: Key-to-line)

NOTE: To be able to work on the parameter level, the password for level 2 (trained personnel) must first be entered.

NOTE: The graph does not change to adapt to the entered values.

Min. pump speed: Pump speed setpoint when the external line speed signal lies below the entered value *Line speed for min. pump speed*.



0.0 min⁻¹

Max. pump speed: Pump speed setpoint when the external line speed signal exceeds the entered value *Line speed for max. pump speed*.



80.0 min⁻¹

Line speed for min./max. pump speed: Line speed signal value in %, below or above which the pumps begin to rotate at the set min./max. speed.



Max: 100.0 %



Min: 0.0 %



Motor (contd.)

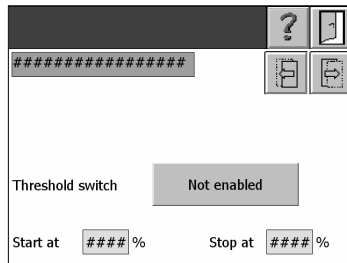


Fig. 4-54 M4



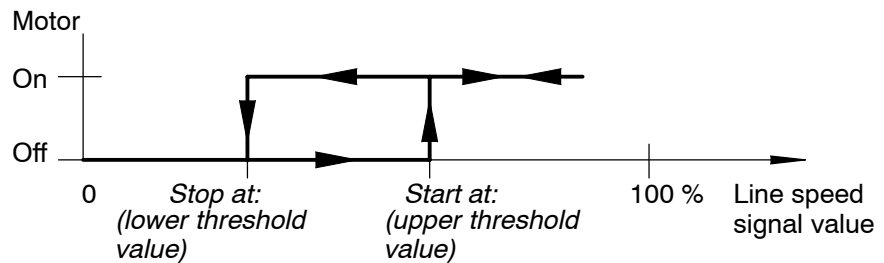
Parameters (Screen 3: Threshold Switch)

NOTE: To be able to work on the parameter level, the password for level 2 (trained personnel) must first be entered.

Threshold Switch

NOTE: The threshold switch is automatically deactivated as long as pressure build-up is enabled.

In threshold switch mode the motors are started and stopped by the line speed signal.



When the upper threshold value is exceeded, the motor starts; when the value falls below the lower value, the motor stops.



Start at: 10.0 %



Stop at: 5.0 %

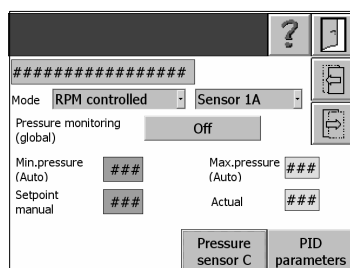


Fig. 4-55 M5



Parameters (Screen 4: Pressure Alarms, Switching Between Speed / Pressure Control, Pressure Setpoints)

NOTE: To be able to work on the parameter level, the password for level 2 (trained personnel) must first be entered.

Pressure Alarm Monitoring (Global)

Global = for all motors

Pressure alarm monitoring is available only with options *Pressure display* and *Pressure control*.

If pressure alarm monitoring is switched on, underpressure and overpressure are monitored. Alarms are triggered depending on the set warning and fault values (Refer to *Pressure Sensor A*).

NOTE: When the speed is regulated in key-to-line mode, an underpressure warning may be displayed during parent machine startup until the melter speed setpoint is reached.

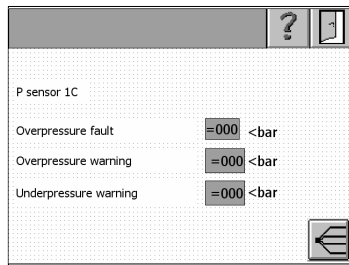
**Motor** (contd.)

Fig. 4-56 M6

Pressure Sensor A

Two pressure sensors (A and B) can be assigned per pump (Refer to *Pressure Sensor Setup* Fig. 4-48). The measured pressures are shown in the motor screen (Fig. 4-50, *M1*).

NOTE: The values for warnings and faults are absolute values in *Speed control* mode with the option *Pressure display*. With the option *Pressure control*, the values are differential values for sensors A and B and absolute values for the sensors C.

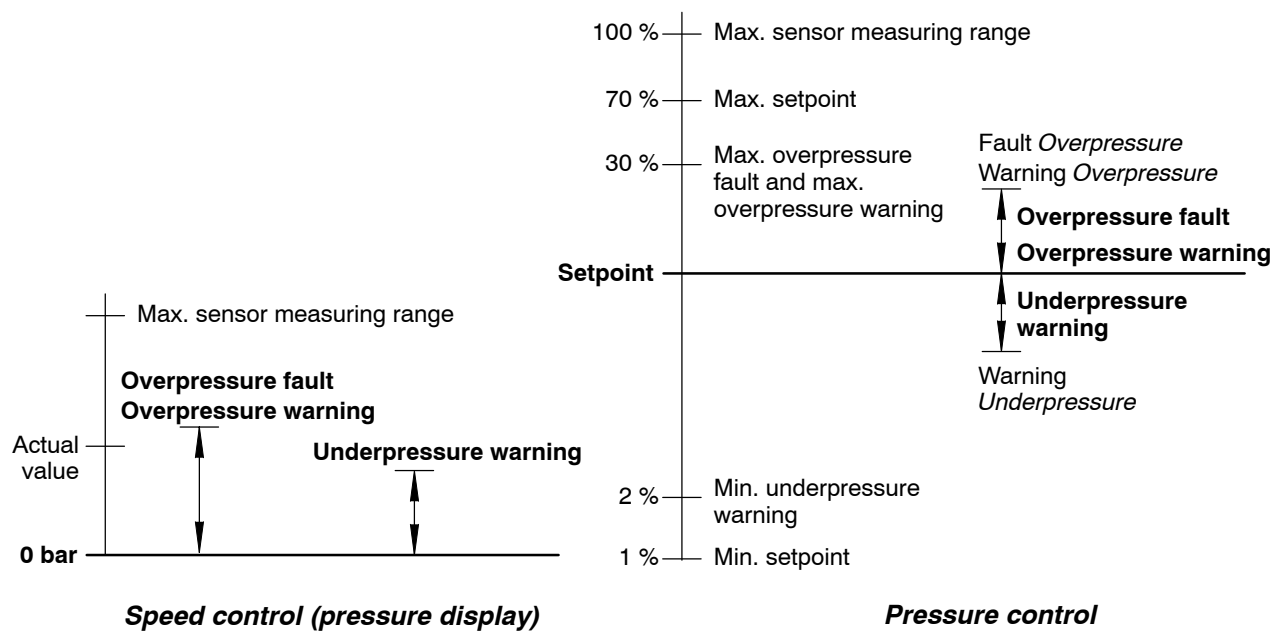


Fig. 4-57

NOTE: The overpressure value for the warning can not be greater than the value for the fault.

NOTE: The overpressure value for the warning/fault can not be less than the value for the underpressure warning.



Overpressure fault: **15 bar** (218 psi)



Overpressure warning: **10 bar** (145 psi)



Underpressure warning: **0 bar** (0 psi)

		?	
		bar	bar
1 C	10	5 C	10
2 C	10	6 C	10
3 C	10	7 C	10
4 C	10	8 C	10

Pressure Sensor C

Unlike pressure sensors A and B, the pressure sensors C are not assigned to a motor. For this reason, the operator is shown a screen with an overview of all sensors and their actual pressure values.

Fig. 4-58

		?	
P SENSOR C1			
Overpressure fault		bar	
Overpressure warning		bar	
Underpressure warning		bar	

P SENSOR 1C To the pressure alarm parameters

NOTE: The values for warnings and faults are absolute values in *Speed control* mode with the option *Pressure display*. With the option *Pressure control*, the values are differential values for sensors A and B and absolute values for the sensors C.

Fig. 4-59 M6.1

Motor (contd.)

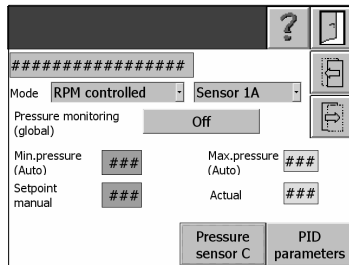


Fig. 4-60

Switching Between Speed Control – Pressure Control



Speed-controlled

Speed Control – Manual Mode

In manual mode the operator has control over the motors. The pump speed is equal to the setpoint and does not change.

Speed setpoint: 5 min⁻¹

Example: Increase Pump Speed

Prerequisite: *Speed control* mode is selected, and the indication lamp next to key *Key-to-line* is off.

1. Touch the green field (rpm) (setpoint).
2. Enter setpoint in the input window and confirm with .
3. If necessary, enable pump (indication lamp next to key  is illuminated)

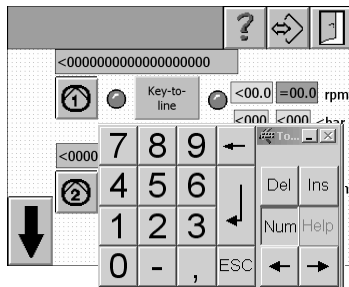


Fig. 4-61

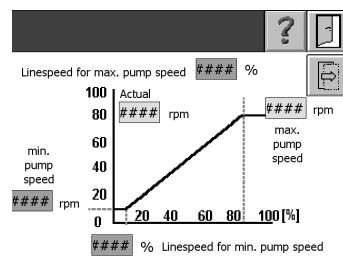


Fig. 4-62

Other Settings

- Speeds (Refer to illustration)
- Touch key *Key-to-line* so that the LED lights up (Refer to Fig. 4-50)

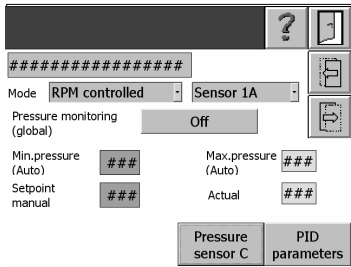


Fig. 4-63 M5

Pressure Control – Manual Mode

In manual mode the operator has control over the motors. The pressure is equal to the setpoint and does not change.

 Only pressure sensor A: **5 bar** (73 psi)

Pressure Control – Key-to-line

Min. pressure: Setpoint pressure when the external line speed signal is 0%.

 **0 bar** (0 psi)

Max. pressure: Pressure setpoint when the external line speed signal exceeds the entered value *Line speed for max. pump speed*.

 **70 bar** (1015 psi)

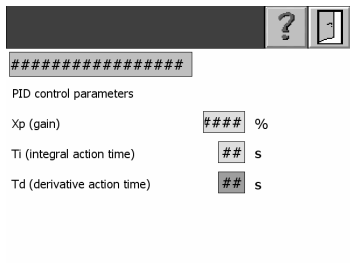


Fig. 4-64 M7

PID Pressure Control Parameters

NOTE: Should be adjusted only by personnel with experience in metrology and control technology.

**Motor** (contd.)**Parameters (Screen 5: Pressure Build-up Feature)**

NOTE: To be able to work on the parameter level, the password for level 2 (trained personnel) must first be entered.

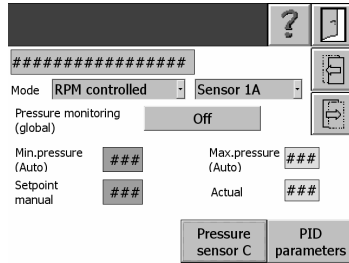
Pressure Build-up Feature

Fig. 4-65 M5

This feature allows the material pressure to be regulated to an adjustable value as soon as the parent machine stops (condition for variation 1) or when the line speed signal falls below an adjustable value (condition for variation 2). This allows the melter to maintain a certain pressure even when there is a break in production.

The pressure sensors A are always responsible for pressure control during pressure build-up.

NOTE: When pumps are in the process of building up pressure, there is no pressure alarm monitoring (sensors A and B).

There is no pressure alarm monitoring for pressure sensors C as soon as at least one pump is building up pressure.

NOTE: The output *Motor running* on the interface *Standard I/O* is switched off as long as the corresponding pump is in the process of building up pressure.

When pressure build-up has been completed for all pumps for which this feature has been selected, meaning that the pressure setpoint has been reached, an indication appears in the status line on the control panel and a signal is switched via the interface *Standard I/O* or the field bus.

NOTE: The threshold switch is automatically deactivated as long as pressure build-up is enabled.

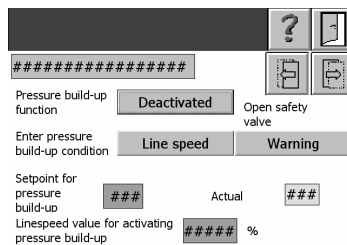


Fig. 4-66

Variation 1: Line stop signal

Enable pressure build-up feature and select condition for which the pressure build-up is to be started (here: *Line stop signal*).

The motors are speed-controlled during production. If the signal *Line stop* is switched via the interface *Standard I/O* or the field bus, the motors are pressure-controlled to the value *Setpoint for pressure build-up*.

As soon as the signal *Line start* is switched, the melter returns to speed-controlled mode.

Switching between Warning/Fault

The operator can choose whether an open safety valve generates a fault (motors are stopped) or a warning.

Variation 2: Line speed

Enable the pressure build-up feature and select the condition for which the pressure build-up is to be started (here: *Line speed*).

The motors are speed-controlled during production. If the line speed signal falls below the value *Line speed value for activating pressure build-up*, the motors are pressure-controlled to the value *Setpoint for pressure build-up*.

As soon as the line speed signal exceeds the value plus 5% (15% in the example), the melter returns to speed-controlled mode.

Switching between Warning/Fault

The operator can choose whether an open safety valve generates a fault (motors are stopped) or a warning.

Motor Circuit Switch (Motor Maintenance Switch)

All motor controllers and motors are deenergized with the motor circuit switch.

This is important when, in the event of maintenance or repair, the melter and heaters must remain switched on but the motors absolutely may not turn.

Padlocks can be used to protect the motor circuit switch from being turned on by unauthorized personnel.



WARNING: It takes about three minutes for all of the motor controllers to be deenergized and actually be free of voltage. The LEDs on the motor controller are then off.

When the motor circuit switch has been turned off, the following text appears in the status line on the control panel: *Motor repair switch open*.

NOTE: When maintenance or repair work has been completed, the motor circuit switch must be turned on again. It can then take up to 10 seconds before the motor controllers have initialized and indicated so to the control unit. The display in the status line does not change until this time has elapsed.

Settings Record

Production information:

--

Material:

Manufacturer

Processing temperature

Viscosity

Cleaning agent:

Manufacturer

Flash point

Processing temperatures (setpoints):

Grid				
Reservoir (high melt)				
Filling valve (option)				
Hose (accessory)	1)	2)	3)	4)
Gun (accessory)	1)	2)	3)	4)
Air heater (accessory)	1)	2)	3)	4)

Speeds / pressures (setpoints):

Pump [min ⁻¹]	1)	2)	3)	4)
Sensor A [bar]	1)	2)	3)	4)
Sensor B [bar]	1)	2)	3)	4)
Sensor [bar]	1)	2)	3)	4)
Sensor [bar]	1)	2)	3)	4)

Air pressures at gun (accessories):

Control air	1)	2)	3)	4)
Spray air	1)	2)	3)	4)

Notes:

--

Name
Date

Settings Record - Spare Copy

Production information:

--

Material:

Manufacturer

Processing temperature

Viscosity

Cleaning agent:

Manufacturer

Flash point

Processing temperatures (setpoints):

Grid				
Reservoir (high melt)				
Filling valve (option)				
Hose (accessory)	1)	2)	3)	4)
Gun (accessory)	1)	2)	3)	4)
Air heater (accessory)	1)	2)	3)	4)

Speeds / pressures (setpoints):

Pump [min ⁻¹]	1)	2)	3)	4)
Sensor A [bar]	1)	2)	3)	4)
Sensor B [bar]	1)	2)	3)	4)
Sensor [bar]	1)	2)	3)	4)
Sensor [bar]	1)	2)	3)	4)

Air pressures at gun (accessories):

Control air	1)	2)	3)	4)
Spray air	1)	2)	3)	4)

Notes:

--

Name

Date

Section 5

Maintenance



WARNING: Allow only qualified personnel to perform the following tasks. Observe and follow the safety instructions in this document and all other related documentation.

NOTE: Maintenance is an important preventive measure for maintaining operating safety and extending the service life of the unit. It should not be neglected under any circumstances.

Risk of Burns



WARNING: Hot! Risk of burns. Wear appropriate protective clothing/equipment.

Some maintenance work can only be done when the melter is heated up.

Relieving Pressure



WARNING: System and material pressurized. Relieve system of pressure before disconnecting hoses, guns and hot melt handguns. Failure to observe can result in serious burns.

Relieve pressure as described in section *Installation, Connecting Hose, Disconnecting*.

Important when Using Cleaning Agents

- Use only a cleaning agent recommended by the hot melt material manufacturer. Observe the Material Safety Data Sheet for the cleaning agent.
- Properly dispose of cleaning agent according to local regulations.

Processing Materials

Designation	Order number	Use
High temperature grease - Can 10 g - Tube 250 g - Cartridge 400 g	P/N 394769 P/N 783959 P/N 402238	To be applied to O-rings and threads NOTE: The grease may not be mixed with other lubricants. Oily/greasy parts must be cleaned before application.
Sealing paste <i>Stucarit 203</i> Tube 100 ml	P/N 255369	Applied to sealing surfaces
Temperature-resistant adhesive <i>Loctite 640</i> 50 ml	P/N 290359	Secures screw connections
Heat transfer compound <i>NTE303</i> 1 g	P/N 1023441	To improve heat conducting of temperature sensors

Preventive Maintenance

The maintenance intervals are general guidelines based on experience. Depending on the operating environment, production conditions and melter hours of operation, other scheduled maintenance tasks may prove necessary.

NOTE: Coupling and motor controller are maintenance-free.

Melter part	Activity	Interval	Refer to
Complete melter	External cleaning	Daily	5-4
	Inspect for external damage	Daily	5-5
	Purge melter with cleaning agent	When material is changed	5-6
Displays and lamps	Safety and function tests	Daily	5-5
Safety valve	Activate piston	Monthly	5-6
Tank	Clean tank by hand	When there is material residue in tank	5-7
	Tighten fixing screws	Every 500 hours of operation	5-7
Fan and Air filter	Check filter, clean or replace if necessary Clean fan screen	Depending on dust accumulation; daily if necessary	5-8
Power cable	Inspect for damage	Every time the melter is serviced	–

Melter part	Activity	Interval	Refer to
Air hoses	Inspect for damage	Every time the melter is serviced	–
Gear pump	Replace Variseal®	When material escapes from the pump shaft	5-9
	Tighten the gland bolt	After initial startup	5-10
	Check for leakage, tighten gland bolt if necessary	Dependent on hours of operation, pump speed and pump temperature Recommendation: Monthly	5-10
	Tighten fixing screws	Every 500 hours of operation	5-10
Motor / gear box	Change lubricant	Every 15 000 hours of operation or every 2 to 3 years	5-11
	Clean fan cover	Depending on dust accumulation; daily if necessary	–
Pressure control valve	Replace outer O-rings (service kit)	At the latest when leakage occurs	5-12
	Disassemble and clean	Every six months	–
Filter cartridge	Replace filter cartridge Disassemble and clean filter cartridge	Depending on degree of material pollution Recommendation: Every 1000 hours of operation	5-14
Safety valve plate	Replace O-rings (service kit)	When the safety valve plate is detached, at the latest when leakage occurs	5-17
Tank isolation valve	Replace O-ring (service kit)	When the tank isolation valve is detached, at the latest when leakage occurs	5-18
Pneumatic safety valve	Performance check; clean or replace if necessary	Every six months	5-19
Pressure sensor	Calibrate	Once/year, more often when conditions dictate	Section Operation
	Check separating membrane for damage	Every time pressure sensor is removed, more frequently if necessary	–
	Check whether hardened or charred material is stuck to the membrane; clean separating membrane if necessary	Every time pressure sensor is removed, more frequently if necessary	5-20

Melter part	Activity	Interval	Refer to
Filling valve (option)	Check control module detection hole; replace complete control module if necessary	When excess material seeps out of detection hole (seals in inside worn)	5-21
Level and overflow protection evaluators	Calibrate	Only when evaluator or level sensor is replaced	Section <i>Repair</i>

External Cleaning

External cleaning prevents impurities created during production from causing the melter to malfunction.



CAUTION: Observe the unit's Degree of Protection when cleaning (Refer to section *Technical Data*).



CAUTION: Do not damage or remove safety labels. Damaged or removed safety labels must be replaced by new ones.

Remove material residue only with a cleaning agent recommended by the material supplier. Heat with an air heater if necessary.

Remove dust, flakes etc. with a vacuum cleaner or a soft cloth.

Nordson recommends the orange cleaning agent P/N 771192 (12 spray bottles, 0.5 l each).

Control Panel



CAUTION: Set the feature *Screen cleaning* (V14 in section *Operation*). This ensures that no functions are unintentionally triggered by touching the screen.

Clean the insides of the plastic frame on the control panel front regularly with a damp, soft cloth. Use caution to ensure that the surface is not scratched or scoured, particularly when removing hard residue and abrasive dust. Do not allow solvents to come into contact with the control panel; solvents could corrode the plastic frame.

Removing Paint Splatters and Grease

Paint splatters and grease can be removed with a 70 % isopropanol solution. Clean with a mild soap and rinse with clear water.

Visual Inspection for External Damage



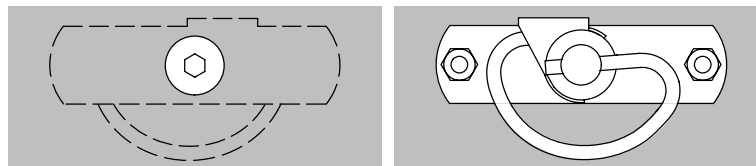
WARNING: When damaged parts pose a risk to the operational safety of the melter and/or safety of personnel, switch off the melter and have the damaged parts replaced by qualified personnel. Use only original Nordson spare parts.

Safety and Function Tests

During power up of the melter, the lights in the light tower are all switched on briefly as a test. The operator should check whether all lights function properly. Replace defective lamps.

Detaching Protective Panels

Open the protective panels with a 4 mm Allan key.



On the inside

Fig. 5-1

Detaching Insulation Blanket

1. Release Velcro and clamps.
2. Take insulation blanket out of hooks.

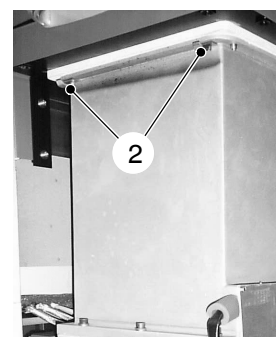


Fig. 5-2

Changing Type of Material

The old material must be removed from the tank (Refer to *Tank, Draining Material*).

NOTE: Before changing the type of material, determine whether the old and new material may be mixed.

- May be mixed: Remaining old material can be flushed out of the melter using the new material.
- May not be mixed: Thoroughly purge the melter with a cleaning agent recommended by the material supplier.

NOTE: Properly dispose of the old material according to local regulations.

Purging with Cleaning Agent



CAUTION: Use only a cleaning agent recommended by the hot melt material manufacturer. Observe the Material Safety Data Sheet for the cleaning agent.

Cleaning agent residue can be flushed out of the unit with new material before production begins again.

NOTE: Properly dispose of cleaning agent according to local regulations.

Safety Valve

Activate the safety valve piston once a month. This prevents the material from blocking the safety valve.

Procedure

1. Relieve melter of pressure as described in section *Installation*.
2. Disconnect all hoses.
3. Close hose connections with Nordson port plugs.
4. **Mechanical pressure control valves:** Measure insertion depth of setting screw (Fig. 5-3: dimension X) and make a note. This ensures that insertion depth can be reproduced. Then close pressure control valve.
5. **Pneumatic pressure control valves:** Shut off compressed air. Operate the melter at full motor speed and with hose connections closed. Switch the motor on and off several times.

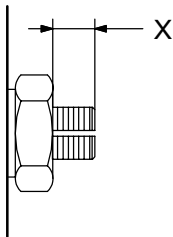


Fig. 5-3

Tank

Draining Material

Allow the melter pump(s) to run until the material has drained from the melter.



CAUTION: Do not feed charred material through the gun. Particles can block the gun. Instead unscrew the hose and feed the material out through the hose connection (Refer to section *Installation*).

If the Unit is Equipped with a Drain Valve (Option)

1. Place a container under the drain valve and open the ball valve.
2. Feed the material out of the drain valve and collect it.
3. Close the ball valve and dispose of the material properly according to local regulations.

Cleaning Tank by Hand

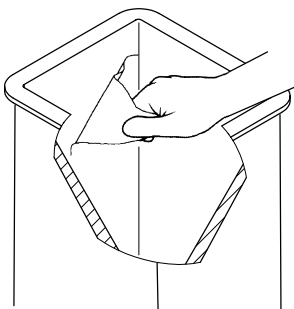


Fig. 5-4

Cold material can usually be peeled off of the sides of the tank (Refer to Fig. 5-4). If necessary, first heat tank to material softening temperature, usually approx. 70 °C / 158 °F.

NOTE: The inside of the tank is release coated. Do not use metallic tools to clean. Do not use wire brushes! This could damage the release coating.

Tightening Fixing Screws

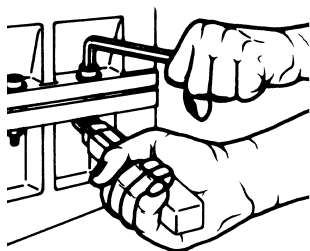


Fig. 5-5

Heating and cooling that occurs during daily operation can cause the fixing screws to loosen. Tighten screw as indicated in the table.

NOTE: Tighten fixing screws only using a torque wrench and when the melter is cold.

Connection	Thread	Torque
Tank / melter chassis	M 8	25 Nm / 220 lbin
Grid (low melt) / reservoir (high melt)	M 8	20 Nm / 177 lbin

Fan and Air Filter

The air filters (1, 2) must be cleaned (knocked out) or replaced, depending on dust accumulation.

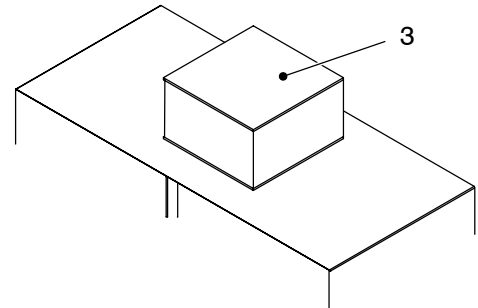
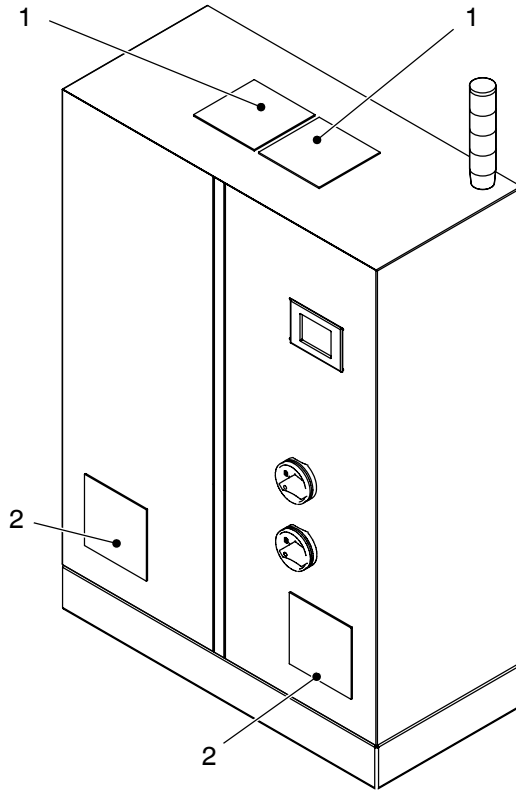


Fig. 5-6

1 Air filter

2 Fan

3 Heat exchanger, (option)

Gear Pump

Checking for Leakage

Gear Pumps with Variseal

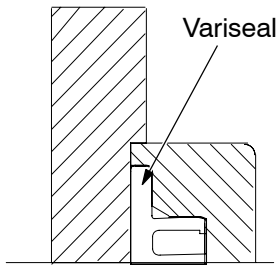


Fig. 5-7

The *Variseal*® is a single-direction shaft seal. It consists of an asymmetric U-shaped sealing body, tensed and held in place by a V-shaped steel spring. To prevent the seal from turning, it has a bracing flange that is clamped in place axially when installed.

Variseals are fixed in place on the gear pump with a flange. If material escapes along the shaft, the *Variseal* must be replaced.

Replacing Variseal

1. Detach the gear pump (Refer to section *Repair*).
2. Release the screws (1) and slide the flange (3) off of the shaft.
3. Remove the old *Variseal* (2).
4. Install a new *Variseal* (2).
5. Slide the flange (3) onto the shaft.
6. Tighten the screws (1).
7. Attach the gear pump again (Refer to section *Repair*).

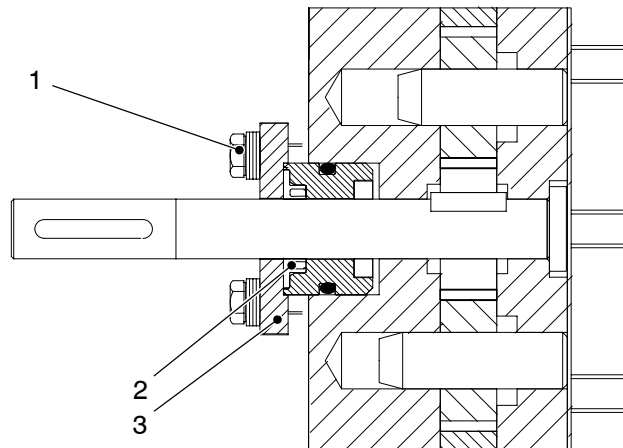


Fig. 5-8

Checking for Leakage *(contd.)*

Gear Pumps with Gland Bolt

The gear pump is equipped with a self-sealing pump shaft seal. Material may seep out of the seal at irregular intervals. The gland bolt must then be tightened.

NOTE: When the pump shaft seal needs to be replaced, Nordson recommends replacing the pump and sending the old one in to be repaired. Only trained personnel can replace the pump shaft seal.

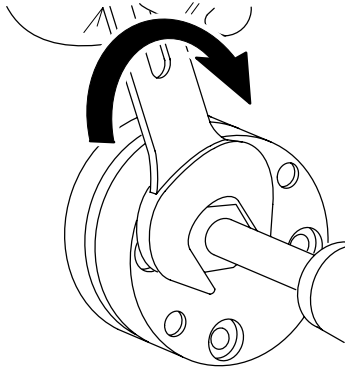


Fig. 5-9

Tightening Gland Bolt

NOTE: Tighten only when the melter and the pump are warm.

Tighten the gland bolt approx. $\frac{1}{4}$ of a revolution in the operating direction of the pump. If tightening is no longer possible, the gear pump must be replaced.

Tightening Fixing Screws

Normal heat cycling (heating and cooling) can cause the fixing screws to become loose.

NOTE: Tighten the fixing screws only when the melter and the pump are cold. Tighten only with a torque wrench (25 Nm / 220 lbin).

Motor / Gear Box



WARNING: Before beginning work near the motor, switch off the melter or, when present, switch off the motor circuit switch (motor maintenance switch, option).

The only motor maintenance required is cleaning the fan cap.

Changing Lubricant

NOTE: Use only the stated lubricant or one that has proven to be equivalent (Refer to *Lubricant Selection*). Using any other lubricant can result in premature wear and/or damage to the gear box.

NOTE: Drain lubricant only when the melter is warm and the lubricant fluid.

Remove gear box from the motor to change lubricant. Wash out casing with suitable cleaning agent and remove lubricant residue.

NOTE: Properly dispose of the old lubricant according to local regulations.

Lubricant Changing Interval

Operating temperature < 100 °C / 212 °F:

Every 15000 hours of operation or at least every 2 to 3 years.

Capacity

The lubricant quantity is indicated on the ID plate. Ensure that the upper gears and rolling bearings are properly lubricated.

NOTE: Different types of lubricant may not be mixed.

Motor / Gear Box *(contd.)*

Lubricant Selection

Lubricant manufacturer	Lubricant (mineral oil CLP 220)
AGIP	Blasia 220
ARAL	Degol BMB 220 or Degol BG 220
BP	Energol GR-XP 220
DEA	Falcon CLP220
ESSO	Spartan EP220 or GP 220
KLÜBER	Klüberoil GEM 1-220
OPTIMOL	Optigear 220
SHELL	Omala Oil 220
TEXACO	Geartex EP-A SAE 85 W-90

Pressure Control Valve



WARNING: Hot! Risk of burns. Wear appropriate protective clothing/equipment.



WARNING: System and material pressurized. Relieve system pressure. Failure to observe can result in serious burns. Refer to section *Installation, Relieving Pressure*.

NOTE: Screw in/out only when valve is warm and material is soft (approx. 70 °C / 158 °F, depending on material).

Important for Mechanical Pressure Control Valve

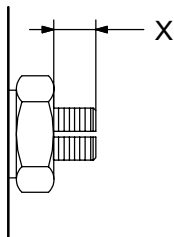


Fig. 5-10

Measuring Insertion Depth

Measure and make a note of the insertion depth of the setting screw (dimension X). This way the insertion depth can be replicated after reassembly.

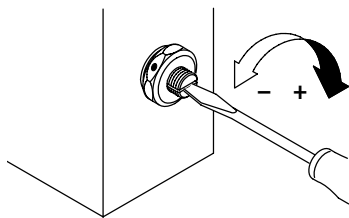


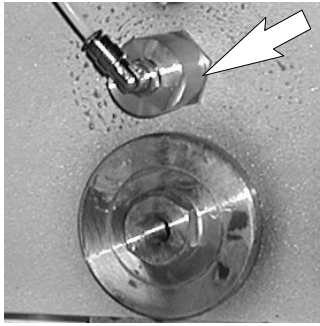
Fig. 5-11

Adjusting Setting Screw

Adjust the setting screw to the recorded dimension X.

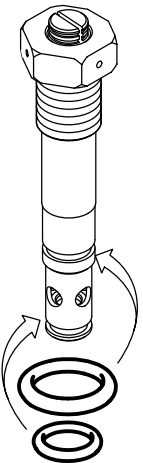
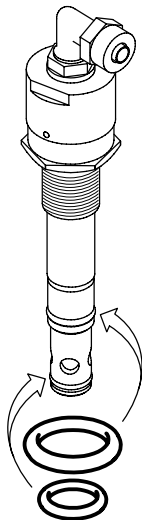
- Turn clockwise to increase material pressure
- Turn counterclockwise to decrease material pressure

Installing Service Kit



Each kit contains two O-rings and high-temperature grease.

Fig. 5-12

Mechanical pressure control valve		Pneumatic pressure control valve (option)	
Service kit P/N: 394600		Service kit P/N: 394600	
Required tools: Open-jawed wrench, size 24 Pliers Torque wrench		Required tools: Open-jawed wrench, size 27 Pliers Torque wrench	
	1. Heat melter to operating temperature.		
	 WARNING: Hot! Risk of burns. Wear appropriate protective clothing/equipment.		
	2. Relieve melter pressure.		
	–	3. Close compressed air supply.	
	4. Refer to <i>Measuring Insertion Depth</i>	4. Unscrew air hose.	
	5. Use an open-jawed wrench to screw out the pressure control valve, then extract with a pliers.		
	If the tank is not empty: Collect any material that may escape (bowl). Quickly screw in a replacement pressure control valve or a plug, then perform maintenance work.		
	6. Remove old O-rings and disassemble and clean pressure control valve.		
	NOTE: Disassemble valve only when warm.		
	7. Install new O-rings. Apply grease to all threads and O-rings.		
8. Guide pressure control valve into the hole when the melter is warm and tighten with torque wrench. Torque: 15 Nm (133 lbin)			
9. Refer to <i>Adjusting Setting Screw</i>	9. Attach air hose.		
–	10. Open compressed air supply again.		

Filter Cartridge

Replacing Filter Cartridge



WARNING: Hot! Risk of burns. Wear appropriate protective clothing/equipment.



WARNING: System and material pressurized. Relieve system pressure. Failure to observe can result in serious burns.

Removing Filter Cartridge

Nordson recommends keeping a supply of filter cartridges on hand to prevent disruptions in production.

NOTE: Remove the filter cartridge when the melter is hot and not under pressure.

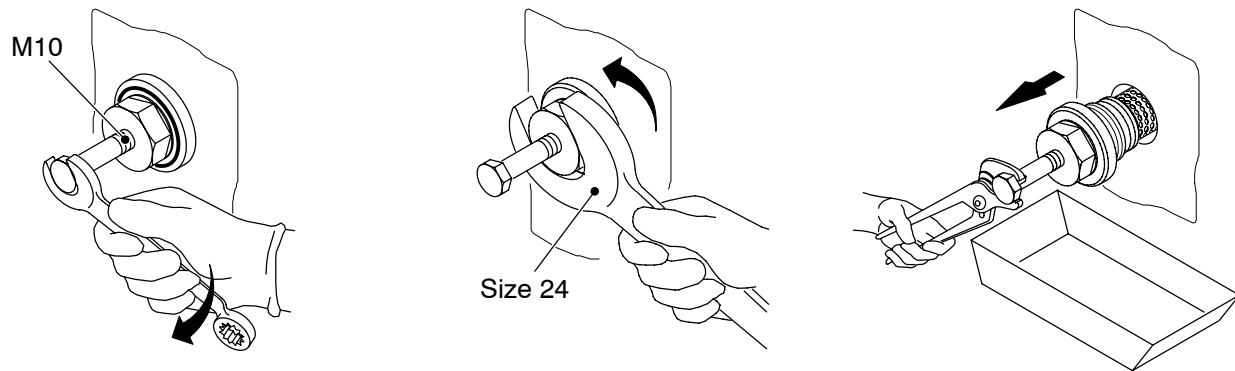


Fig. 5-13

CAUTION: Stop turning as soon as the thread is free; otherwise part of the filter cartridge could remain in the bore.

Use e.g. a pliers to extract the filter cartridge.

If the Tank is not Empty



WARNING: Hot! Risk of burns. Wear heat-protective gloves.

1. Allow the unit to cool until the material is somewhat viscous.
2. Use e.g. a pliers to extract the filter cartridge.
3. Collect any material that may escape (bowl).
4. Quickly screw in a replacement filter cartridge or a plug, then clean the filter cartridge.

Cleaning Filter Cartridge

1. Disassemble the filter cartridge.
2. Use a cleaning agent to remove any material residue that can not be removed mechanically.
3. Always follow the manufacturer's instructions when using cleaning agents!

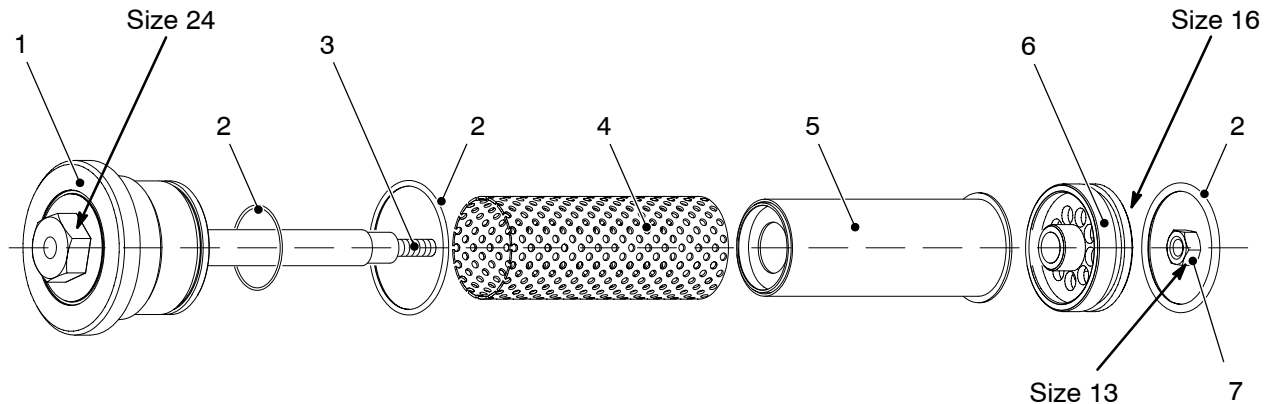


Fig. 5-14

- | | | |
|----------------|-----------------|-------------------------|
| 1 Filter screw | 4 Filter sheath | 6 Nut |
| 2 O-ring | 5 Filter screen | 7 Hexagon nut (locknut) |
| 3 Thread | | |

Assembling Filter Cartridge

1. Clamp the filter screw vertically in a vice.
2. Carefully inspect O-rings; replace if necessary.
3. Assemble the individual parts (Refer to illustration above).
4. Screw the nut (6, Fig. 5-14) onto the thread (3, Fig. 5-14) by hand. Use caution to prevent the filter screen from jamming.
5. Tighten with a torque wrench (size 16).
Torque 14 Nm / 124 lbin.
6. Secure with a locknut; use a torque wrench (size 13).
Torque 24 Nm / 212 lbin.

NOTE: Nordson recommends using an second wrench to brace the nut and prevent it from turning.

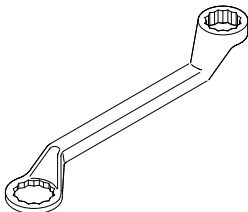


Fig. 5-15

Installing Filter Cartridge

NOTE: Install the filter cartridge only when the melter is hot.

1. Apply high temperature grease to all threads and O-rings (Refer to *Processing Materials* in this section).
2. Insert the filter cartridge (2, Fig. 5-16) in the filter bore and tighten somewhat.
Torque 1 Nm / 8.85 lbin.

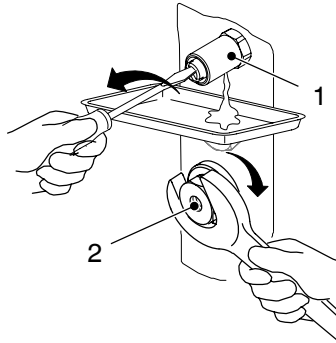


Fig. 5-16

NOTE: The dragged in air must now be removed:

3. Place a container under the respective air relief valve (1, Fig. 5-16).
4. Use a screwdriver to turn the air relief valve screw counterclockwise and open the valve.
5. Allow the pump to run and feed material until it comes out free of bubbles.
6. Use a screwdriver to turn the air relief valve screw clockwise and close the valve.
7. Properly dispose of material according to local regulations.

Installing Service Kit

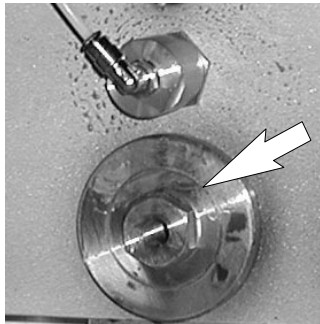
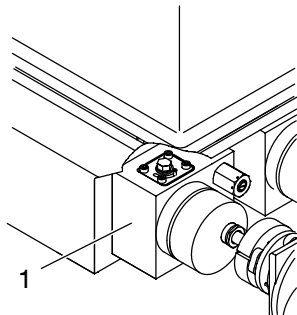


Fig. 5-17

Each kit contains three O-rings, filter sheath, filter screen and high-temperature grease.

Safety Valve Plate

Installing Service Kit



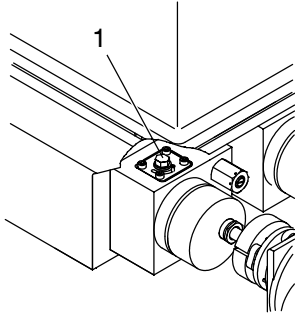
Each kit contains two O-rings, sealing paste and high-temperature grease.

Fig. 5-18

Required tools: Allan key, size 6 (torque wrench)	
A line drawing of a tank with a safety valve plate. Arrows indicate the removal of four screws from the plate and the installation of two O-rings and the plate itself.	1. Heat melter to operating temperature.
	WARNING: Hot! Risk of burns. Wear appropriate protective clothing/equipment.
	2. Empty tank.
	3. Detach pump (Refer to section <i>Repair</i>).
	4. Release the four fixing screws M8 from the safety valve plate and remove plate.
	5. Remove old O-rings and when present, the filter screen in the suction hole.
	6. Clean sealing surfaces on tank, safety valve plate and pump.
	7. If there is one, clean filter screen and place in the groove again, or replace with a new filter screen (P/N 394072).
	8. Apply high temperature grease to O-rings and sealing paste to sealing surfaces. Attach O-rings.
	9. Screw on safety valve plate. Tighten the fixing screws crosswise using a torque wrench. Torque: 25 Nm / 220 lbin
	10. Attach pump (Refer to section <i>Repair</i>).
	11. Fill the tank.

Tank Isolation Valve

Installing Service Kit



Each kit contains one O-ring and high-temperature grease.

Fig. 5-19

Required tools:

Allan key, size 4

Pliers

Open-jawed wrench, size 13, to operate the tank isolation valve

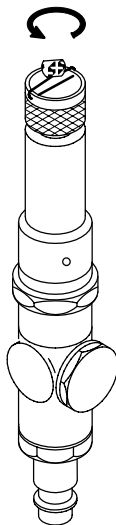
	1. Heat melter to operating temperature. WARNING: Hot! Risk of burns. Wear appropriate protective clothing/equipment. 2. Empty tank. 3. Release four Allan screws M5 and lift off plate. Use a pliers to extract the tank isolation valve from the safety valve plate. 4. Remove old O-ring and clean tank isolation valve. 5. Apply high temperature grease to O-ring, then install again with tank isolation valve. NOTE: Operate the tank isolation valve only when the melter has reached operating temperature.
--	--

Pneumatic Safety Valve

The safety valves, preset at the factory and lead sealed, prevent higher pressurization than permitted of the subsequent pneumatic components. When the factory settings are exceeded, compressed air audibly escapes.

NOTE: The safety valves for the pneumatic options are located in the melter tower.

Performance Check

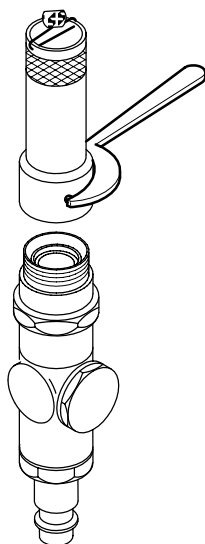


The performance of the safety valve should be checked approx. every six months. Do this by turning the knurled screw until the compressed air is audibly released. If the safety valve does not function properly, it should be cleaned. If it still does not function, it must be replaced.

NOTE: A defective safety valve may be replaced only with an original spare part. Only the manufacturer may perform repairs to the safety valve!

Fig. 5-20

Cleaning



Pollution that has penetrated fitting surfaces and conical nipples can be removed by unscrewing the entire top piece – without changing the minimum operating pressure. Use a sickle wrench to unscrew.

Fig. 5-21

Pressure Sensor

Available only with options *Pressure display* and *Pressure control*.



WARNING: System or material pressurized. Relieve pressure. Failure to observe may result in serious burns.

Cleaning Separating Membrane



WARNING: Hot! Risk of burns. Wear appropriate protective clothing/equipment.

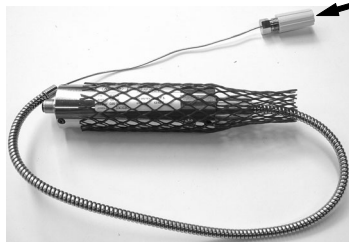


Fig. 5-22

CAUTION: Clean the separating membrane (Fig. 5-20) with particular care. Never use hard tools.

Whenever possible, remove material residue only with a cleaning agent recommended by the material supplier. Thermoplastic substances such as hot melt adhesive may need to be heated with a hot air fan and then carefully wiped off with a soft cloth.

Screwing in Pressure Sensor

NOTE: The unit part and the pressure sensor should be at or near room temperature before the pressure sensor is screwed in firmly.

1. Apply high temperature grease to the thread (Refer to *Processing Materials*).
2. Screw the pressure sensor only into a very clean hole.

NOTE: Do not tilt or jam when screwing into place.

Max. installation torque permitted: 56 Nm / 500 lbin

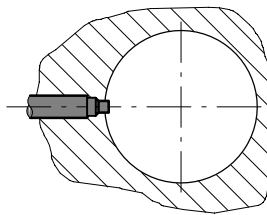


Fig. 5-23 Principle drawing

CAUTION: If the material hole is to be cleaned with a hard object, the pressure sensor must first be removed; otherwise the separating membrane would be damaged.

Filling Valve

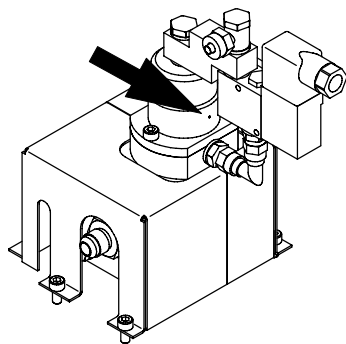


Fig. 5-24 Air relief hole

Available only with option *Level control with filling connection*.
If material seeps out of the air relief hole, the control module must be replaced.

Replacing Control Module

Nordson recommends keeping a supply of control modules on hand to prevent disruptions in production.

NOTE: Replace only when the control module is warm and the material is soft (approx. 70 °C / 158 °F, depending on material).



WARNING: System and material pressurized. Relieve system pressure. Failure to observe can result in serious burns.

1. Disconnect air supply and electrical connection.
2. Release screws M5 and extract control module from the warm filling valve.
3. Put new control module in place and tighten screws crosswise.
4. Re-connect air supply and electrical connection.

NOTE: Observe voltage shown on solenoid valve ID plate.

Control air pressure:

4 to 6 bar	400 to 600 kPa	58 to 87 psi
------------	----------------	--------------

The quality of the compressed air must be at least class 2 in compliance with ISO 8573–1. This means:

- Max. particle size 30 µm
- Max. particle density 1 mg/m³
- Max. pressure dew point – 40 °C
- Max. oil concentration 0.1 mg/m³

Maintenance Record Form

Unit part	Activity	Date	Name	Date	Name
Visual inspection of melter					
External cleaning of melter					
Tank					
Safety valve					
Fan and air filter					
Heat exchanger					
Gear pump					
Motor / gear box					

Unit part	Activity	Date	Name	Date	Name
Pressure control valve					
Filter cartridge					
Safety valve plate					
Tank isolation valve					
Pneumatic safety valve					
Pressure sensor					
Filling valve (option)					
Level and overflow protection evaluators					

Section 6

Troubleshooting



WARNING: Allow only qualified personnel to perform the following tasks. Observe and follow the safety instructions in this document and all other related documentation.

This section contains instructions on troubleshooting. The procedures described here cover only the most commonly occurring problems. If the information supplied here is not sufficient for solving the problem, please consult the Nordson representative.



WARNING: Troubleshooting activities may sometimes have to be carried out when the unit is energized. Observe all safety instructions and regulations concerning energized unit components (active parts). Failure to observe may result in an electric shock.

Helpful Tips

Before starting systematic troubleshooting, check the following:

- Is the seven-day clock set correctly?
- Are all parameters set correctly?
- Is the interface wired correctly?
- In key-to-line mode: Is there a line speed signal provided?
- Do all plug connections have sufficient contact?
- Have circuit breakers been activated?
- Could the fault have been caused by an external PLC?
- Are external, inductive loads (e.g. solenoid valves) equipped with recovery diodes?

Troubleshooting Tables

Melter not Functioning

Problem	Possible Cause	Corrective Action
No line voltage	–	Connect line voltage
Main switch not switched on	–	Switch on main switch
Main switch defective	–	Replace main switch
Main circuit breaker activated	–	Switch on main circuit breaker
Main circuit breaker activated again	Check for short circuit in melter or accessories	–
24 V _{DC} power supply defective	–	Replace

One Channel does not Heat

Problem	Possible Cause	Corrective Action
Channel is deactivated	–	Activate the temperature channel on the control panel (or via the optional field bus)
The channel is assigned to a group, and the group is deactivated or in standby	Check the state of the group in the screen <i>Switch application group(s)</i> (Refer to section <i>Operation</i>)	Activate the group via the control panel, or if set up so, via the Standard I/O interface.

No Line Speed Signal (Voltage / Current / Frequency)

Problem	Possible Cause	Corrective Action
Parent machine not operating	–	Start up parent machine
Polarity of line speed voltage input is reversed	–	Reverse polarity
Encoder defective	–	Replace

No Material (Motor does not Rotate)

Problem	Possible Cause	Corrective Action
System not yet ready	Undertemperature during heatup phase	Wait until the melter has heated up and when appropriate until <i>System ready delay time</i> has expired (<i>System ready</i> appears in the status line).
System currently not ready	Undertemperature during operation Material was refilled	Wait until the melter is heated
Motor not switched on	–	Switch on motor
Motor startup protection activated	Standby entered Undertemperature during operation	Switch on the motor(s) again –
Speed (rpm) not set	The parameter <i>Max. pump speed</i> in key-to-line is on 1 min^{-1}	Set speed (RPM) (Refer to section <i>Operation / Control Panel – Overview – / M3</i>)
Key-to-line mode selected, however melter should be in manual mode	–	Switch to manual mode
No external motor enabling via interface <i>Standard I/O</i>	–	Activate the corresponding contacts of the interface. To do this, the motor enable key must be set to <i>Control panel AND standard I/O</i> .
Key-to-line selected but no line speed signal present	–	Provide line speed signal Check whether the type of input signal is the same as that selected on the control panel (analog/frequency)
Threshold switch not properly set	–	Check and set values on control panel
Standby entered	–	Exit or wait until standby period has expired
Continued...		

No Material (Motor does not Rotate) (contd.)

Problem	Possible Cause	Corrective Action
Motor overheated	Ambient temperature too high Fan cap dirty Pump blocked by foreign matter Pump operates too sluggish Material too cold	Decrease ambient temperature by cooling or airing out Clean Replace pump Replace pump Set temperature accordingly
Motor defective	–	Replace
Motor not supplied with voltage	–	Technical inspection
Motor controller fault	⇒ Motor overheated Motor controller overheated Short circuit Overload (pump blocked by foreign matter, pump too sluggish, material too cold)	Switch melter off and on again with main switch Refer to <i>Motor overheated</i> Decrease ambient temperature by cooling or airing out Clean cooling section of motor controller Check motor cable Refer to <i>Motor overheated</i>
Motor controller defective	–	Replace NOTE: If more than one motor controller has been replaced, the screen <i>Replacing motor controller</i> appears. Refer to section <i>Repair, Replacing Motor Controller</i> .

No Material (Motor Rotating)

Problem	Possible Cause	Corrective Action
Tank isolation valve closed	–	Open
Tank empty	–	Fill tank
Filter cartridge clogged	–	Clean or replace filter screen
Material supply hole to pump or pump suction hole clogged	Blocked by foreign objects/particles Blocked by unmelted material	Detach pump and clean supply hole or suction hole Refer to <i>Too Little Material (Large tank and large quantity of material)</i>
Hose or gun is cold	Hose/gun not connected electrically Hose/gun temperature channel not activated Hose/gun heater defective	Insert plug into the corresponding receptacle (Refer to wiring diagram for assignment) Activate on control panel Replace hose Replace heater cartridge(s) in gun

Too Little Material or Irregular Feeding

Problem	Possible Cause	Corrective Action
Material supply hole to pump or pump suction hole partially clogged	–	Detach pump and clean supply hole or suction hole
Tank isolation valve not completely open	–	Open
Filter cartridge partly clogged	–	Clean or replace filter screen
Pressure control valve defective	–	Clean or replace
Processing temperature set too low	–	Correct temperature setting
Pump block of the gear pump worn	–	Replace pump
Large tank and large quantity of material	Material is not completely melted	Set or increase the <i>System ready delay time</i> on the control panel

Material Pressure too High

Problem	Possible Cause	Corrective Action
Safety valve or pressure control valve dirty and thus blocked	–	Disassemble and clean or replace
Safety valve or pressure control valve defective	–	Replace
Pressure control valve set incorrectly	–	Set to default
Pneumatic pressure control valve (option) pressurized with too high pressure	–	Reduce pressure

Material Pressure too Low

Problem	Possible Cause	Corrective Action
Gear pump is worn	–	Replace pump
Safety valve does not close any more	–	Replace
Pressure control valve dirty and thus clogged	–	Disassemble and clean or replace
Pressure control valve defective	–	Replace
Pressure control valve set incorrectly	–	Set to default
Pneumatic pressure control valve (option) pressurized with too low pressure	–	Increase pressure

Incorrect Motor Rotation in Key-to-line Mode

Problem	Possible Cause	Corrective Action
Line speed signal fluctuates during constant machine speed	Encoder defective or loose contact	Replace
	Drive element (e.g. belt) slips	Eliminate slip

Material Residue in Tank

Problem	Possible Cause	Corrective Action
Tank setpoint temperature set too high	– Material of low quality or not appropriate for application (temperature resistance poor)	Correct temperature setting Consult material supplier

Material Hardens in Tank

Problem	Possible Cause	Corrective Action
Tank setpoint temperature set too high	–	Correct temperature setting
Tank was not supplied with inert gas	– With the option <i>Inert gas equipment</i> Inert gas bottle empty Inert gas control not activated Solenoid valve of inert gas equipment defective	Check whether material supplier has prescribed inert gas Replace Check software configuration code: In box 22 there should be a G instead of an X. Check times for <i>Gas on duration</i> and <i>Gas off duration</i> Replace (The solenoid valve is in the melter tower on the pressure display)

Filling Valve (Option)

Problem	Possible Cause	Corrective Action
No material	No compressed air to control module or compressed air set too low Control module defective	Connect compressed air and set to correct value Replace control module
Filling valve does not heat	Temperature not set Plug not connected Temperature sensor(s) defective	Set on control panel of VersaBlue melter or on filling unit Regulating via VersaBlue Connect to corresponding hose receptacle Regulating via filling unit Connect to hose receptacle Replace
Filling valve does not reach set temperature	Heater cartridge(s) defective	Replace
Solenoid valve does not switch	Solenoid valve is not triggered or is defective	Trigger via customer's PLC or replace solenoid valve

Others

Problem	Possible Cause	Corrective Action
Leakage at pump shaft seal	Pump shaft seal is worn –	Tighten the gland bolt Replace pump
Material pressure too low, output quantity too low	Gear pump is worn	Replace pump
Gear pump blocked	Processed material too cold Foreign material in gear pump	Correct temperature setting (observe data sheet of material manufacturer) Replace pump
Leakage at gun during heatup phase	Safety valve does not open (expansion pressure)	Replace safety valve
Overflow protection (option) is activated, although level has fallen below sensor	Overflow signal was not acknowledged Alarm caused by material residue stuck to sensor	As soon as the level falls below the sensor, disconnect the level control interface plug, wait 10 s and plug in again. The sensor must be cleaned to prevent material residue from immediately triggering another alarm. Check rod probe performance.
Melter always switches to the state <i>Shutdown</i>	One or more control components on the CAN bus have failed CAN bus terminating resistors not connected properly	Check, replace if necessary Terminate CAN bus on both ends (<i>Temperature control board – motor controller</i> or <i>Temperature control board – pressure sensor</i>) with resistance as shown in the wiring diagram.
Control panel always shows 0 (analog pressure sensor)	No sensor is connected, and 0 volt means "no pressure."	Connect sensor and assign on control panel (Refer to section <i>Operation</i>)

Section 7

Repair



WARNING: Allow only qualified personnel to perform the following tasks. Observe and follow the safety instructions in this document and all other related documentation.

Risk of Burns



WARNING: Hot! Risk of burns. Wear appropriate protective clothing/equipment.

Some melter components can only be detached when the melter is heated up.

Observe Before Performing Repairs



WARNING: Risk of electrical shock. Failure to observe may result in personal injury, death, or equipment damage.



WARNING: Disconnect equipment from line voltage before any repairs.

Relieving Pressure



WARNING: System and material pressurized. Relieve system pressure before disconnecting hoses. Failure to observe can result in serious burns.

Relieve pressure as described in the manual, section *Installation, Connecting Hose, Disconnecting*.

Replacing Motor Controller

CAUTION: Connect or disconnect lines only when the melter is deenergized. The motor controller is still energized after switching off. Wait at least three minutes before beginning any work!

Replacing Profibus Module or I/O Module of Motor Controller

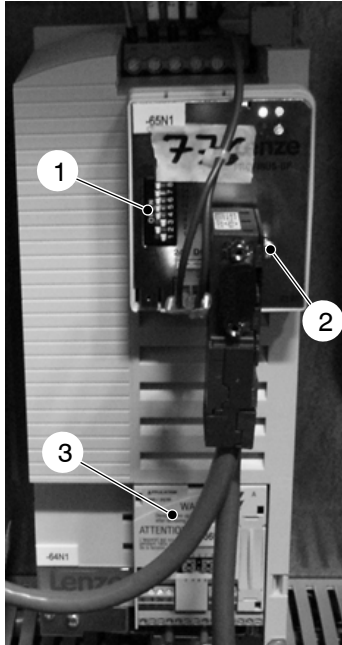


Fig. 7-1

1. Disconnect motor controller from power supply and wait at least 3 minutes.
2. Disconnect Profibus module (1, Fig. 7-1) or I/O board (3, Fig. 7-1) connections.
3. With Profibus module: Release screw (2, Fig. 7-1) .
4. Detach defective module/board from motor controller.
5. Attach new module/board.
6. With Profibus module: Screw on module.
7. Connect according to the labels on the lines.

Profibus Terminating Resistor

The last motor controller along the bus must be equipped with a terminating resistor (120 Ω).

CAUTION: If there are pressure sensors built into the system, the last pressure sensor receives a terminating resistor instead (1, Fig. 7-2).

Replacing Pressure Sensor

Profibus Terminating Resistor

The last pressure sensor along the bus must be equipped with a terminating resistor (120 Ω).

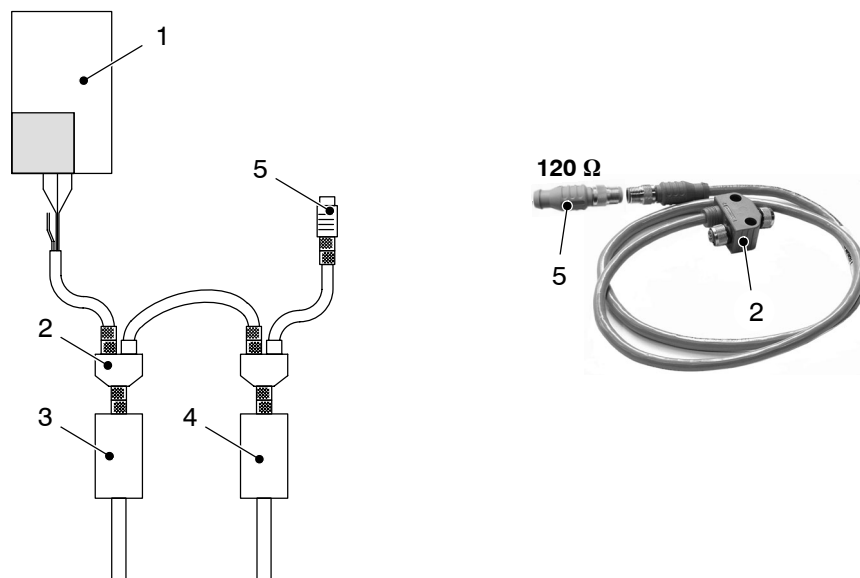


Fig. 7-2 Example with two pressure sensors

- | | | |
|--------------------|-------------------------|------------------------|
| 1 Motor controller | 3 First pressure sensor | 5 Terminating resistor |
| 2 Connector | 4 Last pressure sensor | |

Procedure

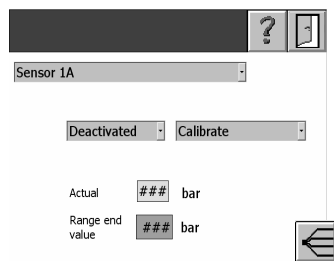


Fig. 7-3 Example

1. Switch off the pressure sensor to be replaced (*P sensor 1* in the example). Refer to section *Operation*.
2. Disconnect the pressure sensor from the profibus.
3. Connect profibus cable to new pressure sensor.
4. Refer to *Pressure Sensor Setup* in the section *Operation* for information on how to proceed.

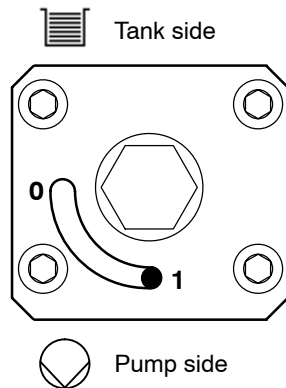
Replacing Gear Pump

Nordson recommends replacing the pump and sending the old one in to be repaired.



WARNING: Hot! Risk of burns. Wear appropriate protective clothing/equipment.

Tank Isolation Valve



NOTE: Operate the tank isolation valve only when the melter is heated to operating temperature.

Pin in position **0**: Closed

Pin in position **1**: Open

Fig. 7-4

Detaching Gear Pump

1. Close tank isolation valve.

NOTE: Detach the gear pump only when the material is soft (70 °C/158 °F, depending on material).

CAUTION: The motor is precisely aligned and may not be slid back with the bracket in the slot.

2. Turn the coupling until the screws of the coupling half shells are more easily accessible.
3. Release the screws of the coupling half shells on the pump side.
4. The released coupling halves can fall apart. Remove carefully to prevent separation. Store the coupling halves and protect them from dust. They will be needed again.

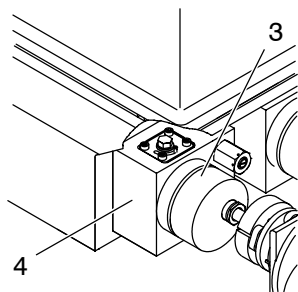


Fig. 7-5

5. Place a container under the pump (3) to collect any material left.
6. Detach pump.
7. Clean sealing surface on the plate (4). If necessary, heat material residue with a hot air fan, then remove.
8. Allow melter to cool to room temperature.

Attaching Gear Pump

NOTE: The gear pump may only be screwed on when the melter is cold.

NOTE: The sealing surfaces on the plate and the pump must be clean. Always replace all O-rings.

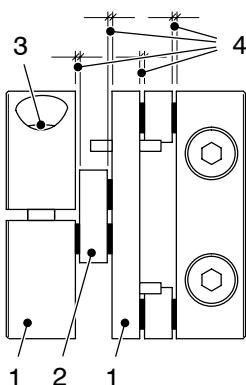
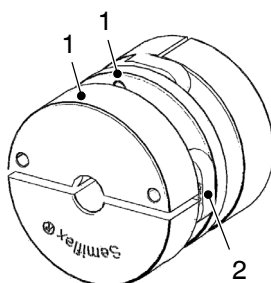


Fig. 7-6

1. Apply sealing paste (Refer to section *Maintenance, Processing Materials*) to the new pump.
2. Apply high temperature grease (Refer to section *Maintenance, Processing Materials*) to the pump fixing screws and attach only when the tank is cold. Tighten screws crosswise using a torque wrench. Torque: 25 Nm / 220 lbin.
3. Refer to *Important Regarding Coupling*
 The axial offset, meaning the sum of the four gaps (4, Fig. 7-7), must result in at least 2 mm (0.08 in) of air to accommodate the heat expansion during operation.
 Permitted radial offset: 1 mm (0.04 in)
 Permitted angle offset: 1°
4. Slide coupling half onto the shaft of the new pump.
5. Center the coupling disks (1) to one another and allow the coupling links (2) to hang vertically (Refer to Fig. 7-7). Turn the coupling half on the motor shaft to its position by hand.
6. Tighten coupling screws (3).
7. Heat melter to operating temperature and open tank isolation valve again.

Replacing Gear Pump *(contd.)*

Detaching Gear Pump *(contd.)*

Important Regarding Coupling

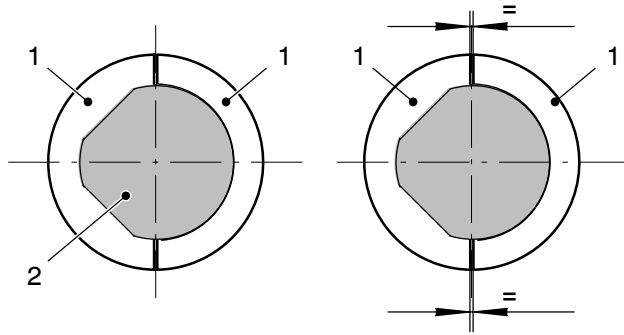


Fig. 7-7

- Turn the half shells (1) such that the diagonal surfaces of the pump shaft (2) rest on those of the coupling half shells (Refer to Fig 7-7).
- The coupling half shells must be tightened such that the gaps are the same size (Refer to Fig. 7-7).

Extract from manufacturer's installation and operating instructions:

- The drive shaft and output shaft should be parallel* to one another. If the axes lean towards one another, excess load is applied to the edges of the bearings, causing premature wear.
- The coupling may not be twisted axially. Intermediate disk should move freely.
- The coupling should not be disassembled. Interchanging of coupling links and disks, damaged sealing rings, polluted bearings, etc. can cause premature malfunctioning.
- All three coupling disks must be aligned to the dimension** of the shaft offset. If the intermediate disk is extremely off-center – meaning that the coupling links are no longer parallel – the coupling may be destroyed upon startup.

* = axially aligned

** = within the permitted shaft offset

Replacing Motor

NOTE: Perform the work only when the material is soft (70 °C/158 °F, depending on material); otherwise the coupling can not be turned.

1. Disconnect motor power cable in the electrical cabinet.
2. Detach plug connector from motor controller.
3. Turn the coupling until the screws of the coupling half shells are more easily accessible.
4. Release the screws of the coupling half shells on the motor side.
5. The released coupling halves can fall apart. Remove carefully to prevent separation. Store the coupling halves and protect them from dust. They will be needed again.

CAUTION: The bracket may not be slid back in the slot or unscrewed.

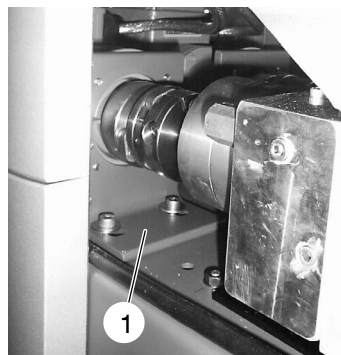


Fig. 7-8

6. Unscrew motor from bracket (1).
7. If there is protective varnish on the shaft of the new motor, remove it.
8. Attach the coupling to the shaft without using force (no jolts or pounding). If this is difficult or impossible, sand the pulley keys and shaft with emery paper. Lubricate pulley keys and shaft if needed.
9. Install new motor in the bracket.
10. Attach coupling (Refer to *Important Regarding Coupling*)
11. Reconnect motor electrically.

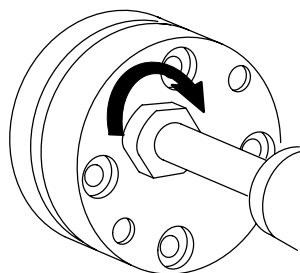


Fig. 7-9 Direction of pump rotation

12. Secure power cable with strain relief. Ensure that cable shield and clamp have contact.
13. Verify that the motor is connected properly. The pump should turn clockwise (See arrow).

Replacing Safety Valve



WARNING: For safety reasons, the safety valve may not be disassembled. The complete valve must be replaced every time.



WARNING: Hot! Risk of burns. Wear appropriate protective clothing/equipment.

Safety Valve

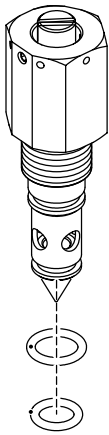


Fig. 7-10

1. Close the tank isolation valve (Fig. 7-4).
2. Use an open-jawed wrench to screw out the safety valve, then extract with a pliers.
3. Remove outer O-rings and clean outside of safety valve.
4. Install new O-rings.
5. Apply grease to all threads and O-rings.
6. To prevent damage to the O-rings, carefully guide the valve into the hole when the melter is warm.
7. Tighten valve with a torque wrench. Torque: 15 Nm (133 lbin)
8. Open tank isolation valve.

Safety Valve with Reed Switch

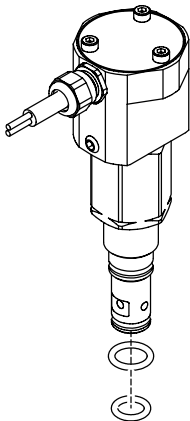


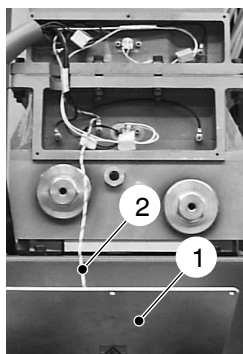
Fig. 7-11

1. Before the safety valve with Reed switch can be detached, the connecting cable must be unscrewed.
2. Refer to *Safety Valve* for other tasks.
3. Screw the cable onto the new safety valve with Reed switch.

Replacing Filter Cartridge

Proceed as described in section *Maintenance* to replace filter cartridge.

Observe when Performing Work behind Electrical Equipment Cover



WARNING: The electrical equipment cover (1) is linked to the ground conductor. The ground conductor (2) must be reconnected after every repair.

Fig. 7-12

Replacing Thermostat

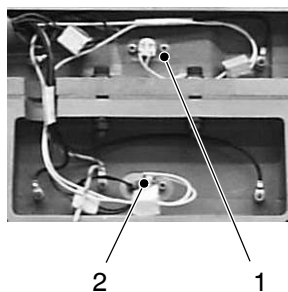


Fig. 7-13

1. Remove electrical equipment cover.
2. Release the fixing screws and remove the defective thermostat (1: in grid or 2: in reservoir).
3. If necessary, clean the fastening point with a lint-free cloth.
4. Attach connecting wires to the new thermostat.
5. Apply heat transfer compound to the bottom of the thermostat (Refer to *Processing Materials* in section *Maintenance*), then fasten it to the tank again.
6. Attach electrical equipment cover again.

Replacing Heating Connection Insulation



WARNING: The unit may not be operated without properly insulated heater connections. Use only Nordson spare parts for insulation.

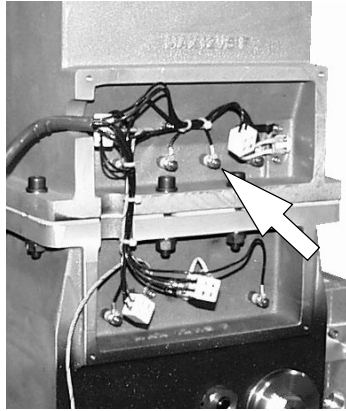


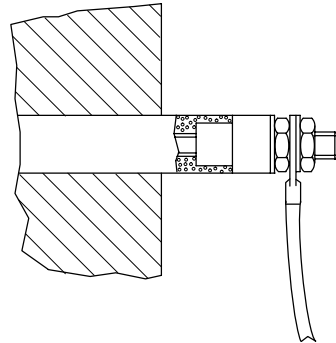
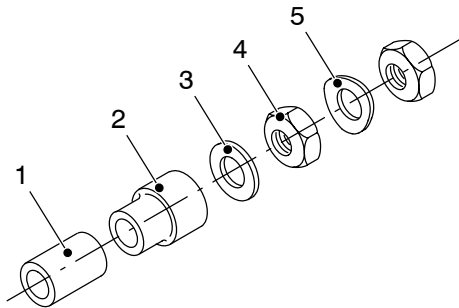
Fig. 7-14

The heater connection insulation may be damaged when maintenance and repair work is performed.

Fig. 7-16 shows the kit for insulating heater connections as well as properly attached heater insulation.

1. Remove nut (4), washers (3 and 5) and insulating cylinder (2).
2. Remove all of the ceramic powder from the heater connection.
3. Guide new insulating cylinder (1) into the heater connection.
4. Attach new insulating cylinder (2), washer (3) and nut (4). Tighten nut carefully until the insulating cylinder (2) is tight and has contact with the heater connection.

5. Attach heater cable, spring washer (5) and nut (4) and tighten nut.



MCTK020L050A0497

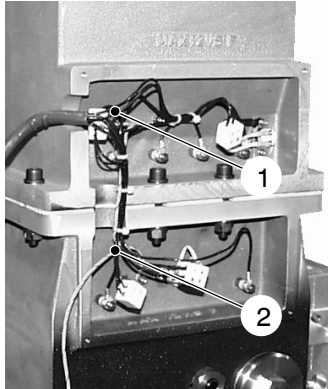
Fig. 7-15

- 1 Insulating cylinder, small
- 2 Insulating cylinder, large

- 3 Washer
- 4 Hexagonal nut

- 5 Spring washer

Replacing Temperature Sensor



1. Remove electrical equipment cover.
2. Disconnect connecting wires and extract defective temperature sensor (1: in grid or 2: in reservoir) by the connecting wires or with the aid of a pliers.
3. Apply heat transfer compound to new sensor.
4. Insert sensor and reconnect electrically.
5. Attach electrical equipment cover again.

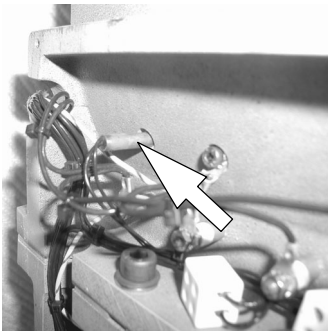


Fig. 7-16

Replacing Level Evaluator (Option)

The evaluator is located on the back wall of the electrical cabinet. The active measuring range is indicated by two lines on the level sensor.

Important Notes

- The length of the sensor cable may not be changed.
- Adjustment by electrostatically charged persons can cause the amplifier to malfunction.
- All adjustments should be made with operating ground (no ground conductor function) connected. The operating ground must be linked to the metal casing of the melter along the shortest path. Do not connect via ground conductor!
- All potentiometers have 20 revolutions and no mechanical limit stop, meaning no fixed end position. They can not be damaged by turning too far.

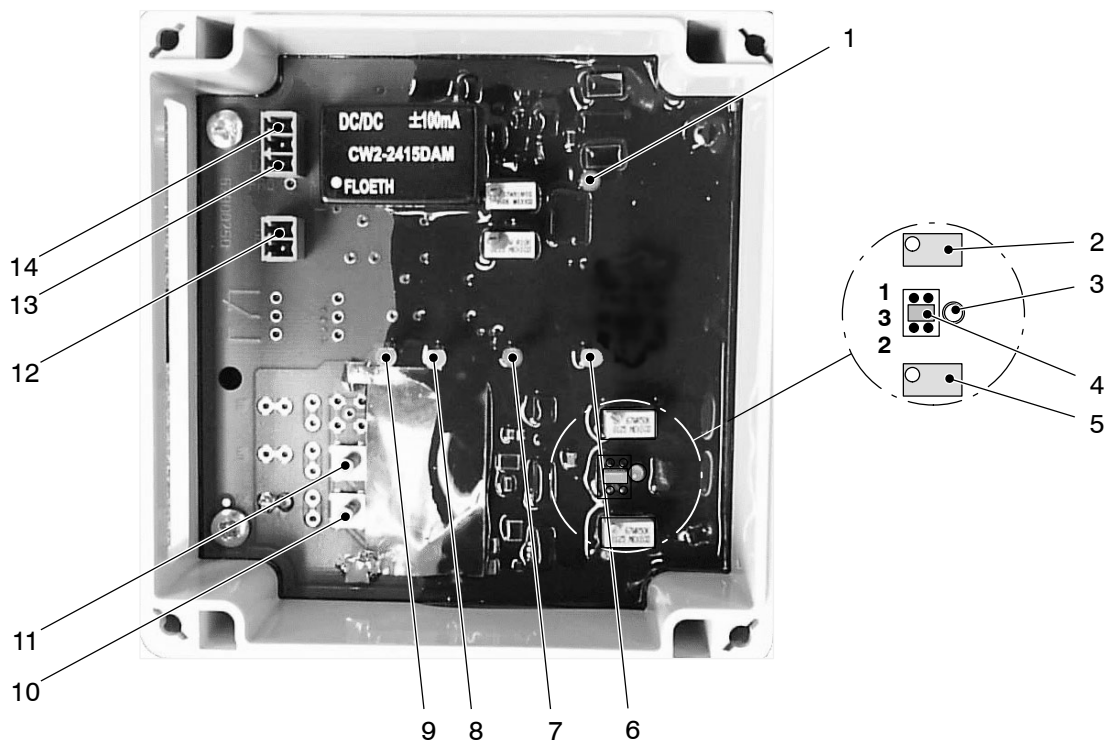


Fig. 7-17

- | | | |
|---------------------------------|---------------------------------|--------------------------------------|
| 1 LED Operating voltage (green) | 6 LED Tank overfilled (red) | 10 Coaxial connection Sensor (black) |
| 2 Potentiometer 1 | 7 LED Level (green) | 11 Coaxial connection Sensor (white) |
| 3 LED Calibration | 8 LED Tank empty (yellow) | 12 Connection Operating ground |
| 4 Jumper Calibration | 9 LED Reference section (green) | 13 Signal output |
| 5 Potentiometer 2 | | 14 Voltage supply (24 V) |

Calibrating

CAUTION: When calibrating, keep hands or conducting tools away from coaxial connections (10, 11, Fig. 7-18) to prevent distortion of the signal.

Prerequisites

- Level sensor is installed, fastened mechanically and connected electrically (observe color of sensor cable)
- Tank empty
- Level sensor is clean
- Operating voltage is applied (LED *Operating voltage* (1, Fig. 7-18) lit).

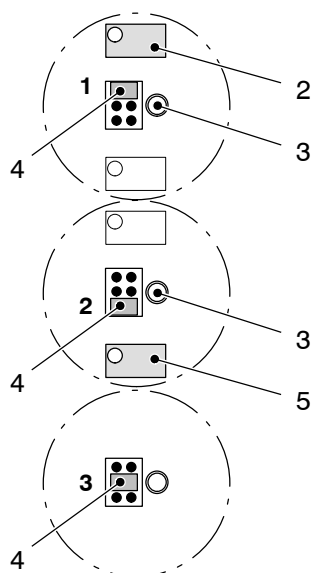


Fig. 7-18

1. Plug jumper *Calibration* (4) into position 1.
2. With potentiometer 1 (2), find the switching point of the LED *Calibration* (3) (LED just lights up).
Turn clockwise: LED on
Turn counterclockwise: LED off
3. Plug jumper *Calibration* (4) into position 2.
4. With potentiometer 2 (5), find the switching point of the LED *Calibration* (3) (LED just lights up).
Turn clockwise: LED on
Turn counterclockwise: LED off
5. Plug jumper *Calibration* (4) into position 3 (center) to switch off the LED *Calibration*.

The evaluator is now ready for operation.

NOTE: The LED *Reference section* (9, Fig. 7-18) lights up as soon as the reference section (area between the lower inactive section and the sensor measuring range) is covered with material.

Replacing Overflow Protection Evaluator (Option)

The evaluator is located on the back wall of the electrical cabinet.

Important Notes

- The length of the sensor cable may not be changed.
- Adjustment by electrostatically charged persons can cause the amplifier to malfunction.
- All adjustments should be made with operating ground (no ground conductor function) connected. The operating ground must be linked to the metal casing of the melter along the shortest path. Do not connect via ground conductor!
- All potentiometers have 20 revolutions and no mechanical limit stop, meaning no fixed end position. They can not be damaged by turning too far.



Fig. 7-19

- | | | |
|--|------------------------------------|----------------------------|
| 1 LED <i>Operating voltage</i> (green) | 3 Potentiometer A | 5 LED <i>empty</i> (green) |
| 2 Potentiometer 3 | 4 Triaxial socket for sensor cable | 6 LED <i>full</i> (red) |

Calibrating

Prerequisites

- Level sensor is installed, fastened mechanically and connected electrically (observe color coding of sensor cable)
- Tank is empty (empty calibration: most sensitive setting, material irrelevant)
- Operating voltage is applied (LED *Operating voltage* (1) lit).

Sensor Break

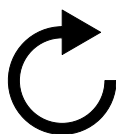
1. Turn potentiometer *A* (3) 20 revolutions counterclockwise.
2. Turn potentiometer *P3* (2) counterclockwise until the green LED *empty* (5) is off and the red LED *full* (6) begins to flash.
3. Turn potentiometer *P3* counterclockwise to the switching point (green LED *empty* on, red LED *full* off).
4. Then turn counterclockwise one or two more revolutions past the switching point.

NOTE: The closer the setting is to the switching point, the more precise is the measurement. When the potentiometer *P3* is turned all the way counterclockwise, sensor break monitoring is deactivated.

5. Perform function test: Disconnect sensor cable; sensor break monitoring is triggered (red LED *full* flashes).



Left



Right

Fig. 7-20 Direction

Limit Switching Points

1. Turn potentiometer *A* clockwise to the switching point (green LED *empty* off, red LED *full* on).
2. Turn back from switching point until the green LED *empty* is on.

Section 8

Parts

How to Use Illustrated Parts List

The parts lists in the separate document *Parts List* are divided into the following columns:

Item— Identifies parts that can be obtained from Nordson.

Part— Nordson part number for each spare part shown in the illustration. A row of hyphens in the column Part (- - - -) indicates that this part can not be ordered separately.

Description— This column contains the name of the part and, when appropriate, its dimensions and other properties. The points in the column *Description* show the relationship between assemblies, subassemblies and single parts.

Quantity— The quantity needed per unit, assembly or subassembly. The abbreviation AR (as required) is used when this item is a bulk item or when the quantity per assembly depends on the product version or model.

HINWEIS: Refer to separate document *Parts List*, P/N 7135001.

Fasteners

Fasteners are shown as *Fx* in every illustration, whereby "x" indicates the number of the fastener in the list *Schedule of Fasteners* at the end of this chapter.

Component Designation

The electrical components are labeled in accordance with DIN 40719, part 2.

Section 9

Technical Data

General Data

Storage temperature	–45 °C to +75 °C	– 49 °F to + 167 °F	
Min. ambient temperature	– 5 °C	+ 23 °F	
Max. ambient temperature	+ 50 °C	+120 °F	
Humidity	10 to 95 %, not condensing		
Max. operating height	3,000 m	9840 ft	
Type of heating	Cast-in electrical resistance heating elements		
Possible temperature sensors	Ni 120 Pt 100		
– Measuring precision	± 1 °C	± 1 °F	(1 digit)
Material pressure	5 to 90 bar	500 to 9000 kPa	72.5 to 1305 psi
	The pressure control valve is preset at the factory. Default:		
	35 bar	3500 kPa	508 psi
Degree of protection	IP 54		
Noise emission (at a distance of 1 m)	1 motor: 60 dB(A) 2 motors: 62 dB(A)		
Motor type	3 ph AC motor		
Gear box type	Helical gear		
Motor/pump speed setting range	1.0 to 100 min ⁻¹ To prevent excessive wear, the motor/pump speed should not continuously fall below 5 min ⁻¹ (rpm) or continuously exceed 80 min ⁻¹ (rpm).		
Heatup time	< 45 minutes		
Melting capacity	1 tank full per hour		

Temperatures

CAUTION: The maximum operating temperature of the installed gun and the other heated system components should be considered when setting temperatures on the melter control panel.

Min. operating temperature	+ 40 °C	+100 °F	
Max. operating temperature	+ 230 °C	+450 °F	
Overtemperature shutdown by thermostat	+ 260 °C	+480 °F	
Max. operating temperature of filling valve (option)	+ 230 °C	+450 °F	

Ni120



Pt100



Fig. 9-1 Hose receptacles

Electrical Data



WARNING: The unit is designed for only one operating voltage. Operate only at the operating voltage shown on the ID plate.

Type designation	VBC-050	VBC-100	VBC-200
Available operating voltages	200 – 240 V _{AC} 3-phase without neutral (<i>Delta</i>) 380 – 415 V _{AC} 3-phase with neutral (star – <i>WYE</i>)		
Permissible voltage deviations	Power supply: $\pm 10\%$ I/O: $\pm 10\%$		
Operating voltage frequency	50/60 Hz		
Melter fuse protection	Refer to ID plate		
Max. melter load	Refer to ID plate		
Max. no. of hose/gun connections	8 (unit + accessories)		
Max. load (accessories)	Max. 8 pairs		
● Per hose/gun	2000 W		
● Per hose/gun pair*	4000 W		
● Total	43 400 W	53 400 W	98 400 W
Key-to-line Max. input	0 to 10 V _{DC}		

Mechanical Data

Type designation	VBC-050	VBC-100	VBC-200
Tank volume [liters]	50	100	200
Tank extension [liters]	25	50	100
Number of hose connections	2 per pump stream		

Dimensions

Type designation	VXC-050	VXC-50H	VXC-100	VXC-10H	VXC-200	VXC-20H
Width W [mm]	1250		1500		2400	
Width W1 [mm]	632		882		882	
Height H1 [mm]	1374	1597	1374	1597	1374	1597
Height H2 [mm]	–	223	–	223	–	223

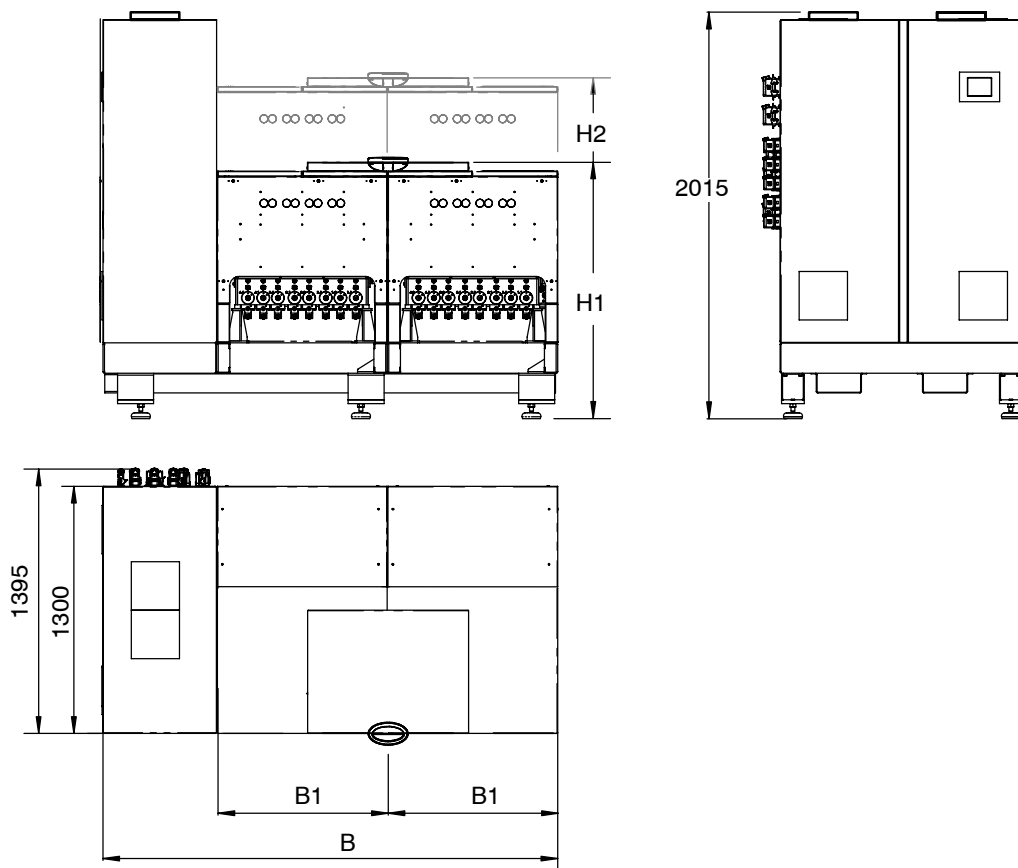


Fig. 9-2

Appendix A

General Instructions Regarding Working with Application Materials

Definition of Terms

Application materials can be e.g. thermoplastic hot melt materials, adhesives, sealants, liquid adhesives and similar application materials. They are referred to as materials.

NOTE: The materials that may be processed with your Nordson product are described in the manual under *Intended Use* and *Unintended Use*. When in doubt, please contact your Nordson representative.

Manufacturer Information

Materials may be processed only when the manufacturer's product descriptions and Safety Data Sheets (MSDS) are observed.

They provide information, amongst other things, on correct processing of the product, transport, storage and disposal. Information regarding reactivity and potentially hazardous decomposition products, toxic properties, flash points, etc. can also be found there.

Liability

Nordson is not be liable for danger or damage resulting from the materials.

Risk of Burns

There is a risk of burns when handling heated materials. Work carefully and wear appropriate protective clothing/equipment.

Vapors and Gases

Ensure that vapors and gases do not exceed the prescribed limits. If necessary, exhaust vapors and gases and/or provide sufficient ventilation of the work space.

Substrate

The substrate should be free of dust, grease and moisture. The suitable material, optimum working conditions, and possible pre-treatment of the substrate must be determined by testing.

Processing Temperature

When materials require heating, adherence to the prescribed processing temperature is imperative to ensure the quality of the application. It may not be exceeded! Overheating can cause material coking or cracking, resulting in malfunctioning or unit failure.

Material should always be melted gently. Extended, unnecessary temperature load should be avoided. The temperature should be reduced during breaks in work. The temperature in the tank should be attuned to the material consumption. Thus it is close to the prescribed processing temperature for high material consumption and lower for lower consumption.

When materials are processed cold, take into consideration the shear heat and the ambient temperature; cool if necessary.

Appendix B

Index Protocols and Communication Data List

General Information

The field bus interface provides the ability to centrally compile data for further processing.

Appendix B applies to the PROFIBUS field bus. For better comprehension, only the pair master/slave is used in the text. The Nordson melter is the slave, the customer's control system the master.

The customer's control system must provide a suitable interface.

Control Modes

The modes *Standard* and *Field bus* are available in conjunction with the option *Field bus communication*. The mode can be changed only on the melter control panel.

Standard

- Control access only from control panel and from external control signals via the interfaces.
- Parameter input only via control panel
- On the master, all parameters can be displayed but not changed. The master can read actual values.
- **AND** link for switching on the motors (Refer to section *Operation, Initial Startup*)

Control Modes *(contd.)*

Field Bus

In *Field bus* mode, the master controls the melter:

- Control access only from master. Control via the interfaces *Standard I/O* and *Key-to-line*.
- Parameter input only via master
- On the control panel, all parameters can be displayed but not changed.

Data Interface

When data is exchanged between the master and Nordson melters, the data is accessed via indexes (*Data index*). All of the communication data is compiled in the communication data list.

The index process works with small data blocks. This prevents the field bus from being burdened with unnecessary data.

In the selection of the index protocol, the operator determines how the data blocks are transmitted.

Transmission and Receive Data Block

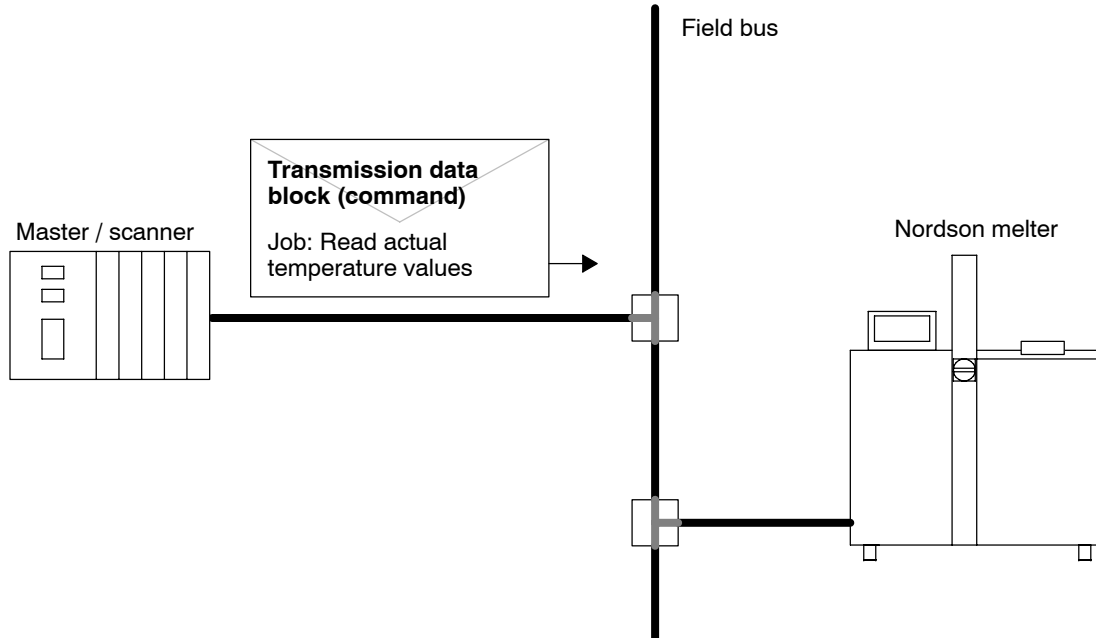
NOTE: Communication is always seen from the point of view of the master.

Two data blocks aid in communication. A block transmitted by the master is the same as a command to the Nordson melter; a received data block is the same as a reply from the Nordson melter.

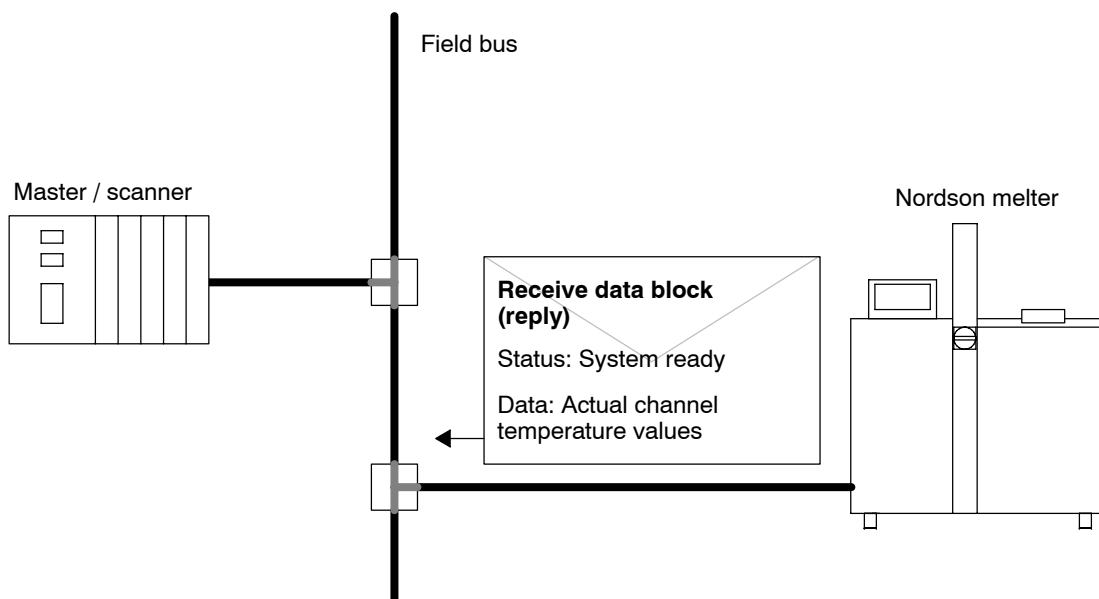
The master may not formulate and transmit a new command until after arrival of the receive data block.

The following illustrations show an example of the retrieval of actual temperature values.

The master sends a transmission data block to the Nordson melter. The data block contains a job that the Nordson melter is to process.



The Nordson melter replies to each transmission data block with a receive data block. The receive data block contains status information on job processing as well as the requested data.



Data Block Processing

The master formulates a job by determining the transmission data block. The Nordson melter processes the job and formulates the reply (receive data block).

The master processes the data or repeats the job until a reply is received from the Nordson melter. Only one job is processed at a time. The Nordson melter keeps the reply available until the master formulates a new job.

When a job (*Command*) can not be executed, the Nordson melter replies with a fault signal in *Status*. The master recognizes by this signal whether the previously transmitted command was correctly processed by the Nordson melter.

The master must check whether the *Acknowledge data* (*Data index* and *Channel number*) from the Nordson melter corresponds to the data in the transmission data block. If the data are identical, the job is completed. Each data index can also be retrieved to check values written earlier.

NOTE: *Melter control*, *Melter control1* and *Melter control2* and *Line speed value for motor 1–n* are processed by the Nordson melter for every transmission data block, regardless of what was entered by *Command*.

Index Protocol and Data Image

The data blocks are always the same length. The sequence of the data image must be followed (1st block: outputs, 2nd data block: inputs).

NOTE: Add the assembly *CP 342-5* to the S7 hardware configuration of the customer's master. Add a universal board to position 1.

Data Image	Direction of data flow
44 bytes, consistent, outputs	Transmission data block
24 bytes, consistent, inputs	Receive data block

NOTE: The Profibus address in the assembly *CP 342-5* is standardly address 10.

Transmission data block (extended)		
Byte address	Format	Designation
N	Word	Melter control 1  Bit 0: Heaters ON/OFF Bit 1: All motors ON/OFF (collective enable) Bit 2: Line started / stopped * * Applies to the features pressure build-up and flow control, variation 1 (box:14, code:T)  Bit 3: Standby  Bit 4: Key-to-line / manual mode (for all motors) Bit 5 to 15: <i>Reserved</i>
N + 2	Word	Melter control 2 Bit 0: Enable motor 1 Bit 1: Enable motor 2 ... Bit 11: Enable motor 12 Bit 12 to 15: <i>Reserved</i>
N + 4	Word	Command
N + 6	Word	Data index
N + 8	Word	Channel number
N + 10	Word	Write data value* * Values with decimal places must be multiplied by the factor 10.
Continued ...		

Transmission Data Block (Extended) (contd.)		
N + 12	Word	Line speed value for motor 1 (key-to-line mode)** ** The value to be transmitted is always multiplied by the factor 10.
N + 14	Word	Line speed value for motor 2 (key-to-line mode)**
N + 16	Word	Line speed value for motor 3 (key-to-line mode)**
N + 18	Word	Line speed value for motor 4 (key-to-line mode)**
N + 20	Word	Line speed value for motor 5 (key-to-line mode)**
N + 22	Word	Line speed value for motor 6 (key-to-line mode)**
N + 24	Word	Line speed value for motor 7 (key-to-line mode)**
N + 26	Word	Line speed value for motor 8 (key-to-line mode)**
N + 28	Word	Line speed value for motor 9 (key-to-line mode)**
N + 30	Word	Line speed value for motor 10 (key-to-line mode)**
N + 32	Word	Line speed value for motor 11 (key-to-line mode)**
N + 34	Word	Line speed value for motor 12 (key-to-line mode)**
Other words		Reserved

NOTE: The communication data is transmitted in Intel format, i. e. the low byte of a word is placed on the lowest address and the high byte on the highest address.

Receive data block (extended)		
Byte address	Format	Designation
N	Word	Status 1 Bit 0: System ready Bit 1: Startup protection Bit 2: General alarm –warning– Bit 3: General alarm –fault– Bit 4: Shutdown Bit 5: Heatup phase Bit 6: Standby Bit 7: Fill tank Bit 8: Heaters OFF/ON Bit 9: Control mode: Standard Bit 10: Control mode: Field bus Bit 11: Control mode: Dual Bit 12: <i>Reserved</i> Bit 13: <i>Reserved</i> Bit 14: Index protocol error Bit 15: Communication data fault
Continued ...		

Receive Data Block (Extended) (contd.)		
N + 2	Word	Status 2 Bit 0: Motor 1 running Bit 1: Motor 2 running ... Bit 11: Motor 12 running Bit 12 to 15: <i>Reserved</i>
N + 4	Word	Acknowledge: Data index
N + 6	Word	Acknowledge: Channel number
N + 8	Word	Read data value 1* * Received data with decimal places must be divided by the factor 10.
N + 10	Word	Read data value 2*
N + 12	Word	Read data value 3*
N + 14	Word	Read data value 4*
N + 16	Word	Read data value 5*
N + 18	Word	Read data value 6*
Other words		<i>Reserved</i>

Protocol Data

Melter Control

With *Melter control*, control signals are transmitted with every transmission data block that the Nordson melter processes, regardless of what was entered by *Command*.

NOTE: Empty or reserved bits must be set to 0 (zero).

Bit			Value	Action
Standard	Extended			
Melter control	Melter control 1	Melter control 2		
0	0	–		Heaters ON
				Heaters OFF
1	1	–	1	All motors ON (collective enable)
			0	All motors OFF
–	2	–	1	Line started
			0	Line stopped
6	3	–		Enter standby
				Exit standby
7	4	–		Key-to-line mode (for all motors)
				Manual mode (for all motors)
2	–	0	1	Enable motor 1
			0	No motor 1 enable
3	–	1	1	Enable motor 2 (if there is a motor 2)
			0	No motor 2 enable
4	–	2	1	Enable motor 3 (if there is a motor 3)
			0	No motor 3 enable
5	–	3	1	Enable motor 4 (if there is a motor 4)
			0	No motor 4 enable
Continued ...				

Melter Control (contd.)

Bit			Value	Action
Standard	Extended			
Melter control	Melter control 1	Melter control 2		
–	–	4	1	Enable motor 5 (if there is a motor 5)
			0	No motor 5 enable
–	–	5	1	Enable motor 6 (if there is a motor 6)
			0	No motor 6 enable
–	–	6	1	Enable motor 7 (if there is a motor 7)
			0	No motor 7 enable
–	–	7	1	Enable motor 8 (if there is a motor 8)
			0	No motor 8 enable
–	–	8	1	Enable motor 9 (if there is a motor 9)
			0	No motor 9 enable
–	–	9	1	Enable motor 10 (if there is a motor 10)
			0	No motor 10 enable
–	–	10	1	Enable motor 11 (if there is a motor 11)
			0	No motor 11 enable
–	–	11	1	Enable motor 12 (if there is a motor 12)
			0	No motor 12 enable

Status

With *Status*, general information and communication data, to be evaluated by the master, are received with every receive data block.

Bit			Value	Action
Standard Status	Extended Status 1 Status 2			
0	0	–	1	System ready
			0	System not ready
1	1	–	1	Startup protection active (warning)
			0	No startup protection The motor startup protection prevents the motors from starting up on their own after heatup or after a fault. The melter goes to startup protection if at least one motor was running before heatup or before the fault occurred. Acknowledge startup protection Set <i>All motors ON/OFF (collective enable)</i> . (rising edge; refer to <i>Melter control</i> : If bit 1 = 0, then set to 1. If bit 1 = 1, set to 0 then back to 1). All enabled motors are running again.
2	2	–	1	General alarm –warning–
			0	No warning
3	3	–	1	General alarm –fault–
			0	No fault
4	4	–	1	Shutdown
			0	No shutdown
5	5	–	1	Heatup active
			0	No heatup
6	6	–	1	Standby entered
			0	Standby exited
11	7	–	1	Tank is being filled
			0	Tank is not being filled
12	8	–	1	Heaters OFF
			0	Heaters ON
Continued ...				

Status (contd.)

Bit			Value	Action
Standard Status	Extended Status 1 Status 2			
–	9	–	1	Control mode: Standard
			0	No standard mode
–	10	–	1	Control mode: Field bus
			0	No field bus mode
–	11	–	1	Control mode: Dual
			0	No dual mode
14	14	–	1	Index protocol error: Incorrect <i>Command</i> received Incorrect <i>Data index</i> received Incorrect <i>Channel number</i> received
			0	No index protocol error
15	15	–	1	Communication data fault in the <i>Data value</i> or <i>Line speed value</i> Data values can not be changed. Example: Write job for actual values. Data access not permitted. Example: Write jobs in <i>Standard</i> mode or jobs for channels that are not installed. The data value or at least one line speed signal value is invalid. The data block received may not be evaluated by the master. Example: A value is outside of the permitted value range.
			0	No communication data fault
7	–	0	1	Motor 1 running
			0	Motor 1 not running
8	–	1	1	Motor 2 running (if there is a motor 2)
			0	Motor 2 not running
9	–	2	1	Motor 3 running (if there is a motor 3)
			0	Motor 3 not running
10	–	3	1	Motor 4 running (if there is a motor 4)
			0	Motor 4 not running
Continued ...				

Bit			Value	Action
Standard Status	Extended Status 1 Status 2			
–	–	4	1	Motor 5 running (if there is a motor 5)
			0	Motor 5 not running
–	–	5	1	Motor 6 running (if there is a motor 6)
			0	Motor 6 not running
–	–	6	1	Motor 7 running (if there is a motor 7)
			0	Motor 7 not running
–	–	7	1	Motor 8 running (if there is a motor 8)
			0	Motor 8 not running
–	–	8	1	Motor 9 running (if there is a motor 9)
			0	Motor 9 not running
–	–	9	1	Motor 10 running (if there is a motor 10)
			0	Motor 10 not running
–	–	10	1	Motor 11 running (if there is a motor 11)
			0	Motor 11 not running
–	–	11	1	Motor 12 running (if there is a motor 12)
			0	Motor 12 not running

Command

The master has to send a *Command* to the Nordson melter. Every *Command* is defined by a job identification.

Job identification	Function
1 _{dez}	No job for the Nordson melter
3 _{dez}	The master wishes to read data from the Nordson melter
6 _{dez}	The master wishes to write data to the Nordson melter

All other job identifications are invalid and generate an index protocol error in *Status*.

Command (*contd.*)

Communication Monitoring

If the job identification is 0 (zero) and the melter is in *Field bus* mode, *Field bus communication failure* is indicated on the control panel.

Possible faults

- Programming error. The master was programmed incorrectly with Command=0.
- Field bus cable broken, defective or not connected
- Interruptions in communication, e.g. if the master is not switched on
- Defective or missing bus terminating resistor
- The network was not set up properly
- Sudden resets or crashes, e.g. due to electro-magnetic interference
- With PROFIBUS, also refer to *Diagnosis Using Bus Port Plug LEDs* in the appendix *Profibus-DP*.

NOTE: When a fault occurs, the melter control system stops all motors that are running.

Data Index

Indexes determined by the master are assigned to the communication data. The data index is used to address communication data that is to be transmitted or received (Also refer to *Communication Data List*).

If the *Acknowledge data index* of the receive data block is identical with the transmitted data index, the job is completed.

Data index set to "0" (zero) is interpreted as *No data index*.

Channel Number

The master has to determine a channel number that is valid e.g. for a temperature channel, pressure channel or motor.

Beginning with the determined channel number as starting channel, the command to read data for six sequential channels is executed.

The range of channel numbers extends from 0 to 18. *Channel number* set to "0" (zero) is interpreted as *No channel number*.

If the *Acknowledge channel number* of the receive data block is identical with the transmitted channel number, the job is completed.

NOTE: Channel number "0" is used for general melter data, e.g. program versions.

Write Data Value

In *Write data value* the master writes the data values for the settings in the Nordson melter.

NOTE: The communication data is transmitted in Intel format, i. e. the low byte of a word is placed on the lowest address and the high byte on the highest address. The master may need to switch bytes, if the formats of the master and the Nordson melter do not agree.

Example 1

The master writes a data value of 25 minutes for the parameter *System ready delay time* {9}.

Transmission data:

Data index	Channel number	Write data value
9	0	25 dez (25 min)

Example 2

The master writes a data value of 31.5⁻¹ for the parameter *Speed setpoint in manual mode* {32} for motor 1.

Transmission data:

Data index	Channel number	Write data value
32	1	315 dez (31.5 min ⁻¹)

Transmission data with decimal places, such as parameters and setpoints, must be multiplied by 10 for transmission.

Read Data Value

In *Read data value* the master reads the data values received from the Nordson melter. The *Read data values* of six sequential channels are transmitted with every receive data block (Refer to example).

Example 1

The master reads the actual temperature values {120}. *Channel number* is set to 9.

Received data:

Data index	Channel number	Read data value
120	9	150 _{dez} (150 °C)
	10	151 _{dez} (151 °C)
	11	160 _{dez} (160 °C)
	12	165 _{dez} (165 °C)
	13	172 _{dez} (172 °C)
	14	180 _{dez} (180 °C)

Received data with decimal places must be divided by the factor 10; the remainder is the decimal.

Example 2 (Standard Index Protocol)

If the master sets *Data index* to 0 (zero) in the transmission data block, the Nordson melter sets all *Read data values* to 0 (zero).

The master sets *Data index* to 0 (zero). *Status* of the Nordson melter is *System ready*.

Transmission data block:

Melter control	Command	Data index	Channel number	Write data value	Line speed value (key-to-line) for motor			
					1	2	3	4
...		0		...				

Receive data block:

Status	Acknowledge: Data index	Acknowledge: Channel number	Read data value					
			1	2	3	4	5	6
0001 _{hex}	0	...	0	0	0	0	0	0

Example 3 (Standard Index Protocol)

If the transmission data block is faulty, the Nordson melter sets all *Read data values* to 0 (zero).

The master sets *Data index* to the faulty value 999. *Status* of the Nordson melter is *System ready* and *Index protocol error* in the *Data index*.

Transmission data block:

Melter control	Command	Data index	Channel number	Write data value	Line speed value (key-to-line) for motor			
					1	2	3	4
...		999		...				

Receive data block:

Status	Acknowledge: Data index	Acknowledge: Channel number	Read data value					
			1	2	3	4	5	6
4001 _{hex}	999	...	0	0	0	0	0	0

Example 4

The Nordson melter sets invalid *Read data values* to 0 (zero).

The Nordson melter has three motors. All motors run at a speed of 26.3 min^{-1} . The master reads the actual speed {36}.

Received data:

Data index	Motor	Read data value
36	1	263 _{dez} (26.3 min^{-1})
	2	263 _{dez} (26.3 min^{-1})
	3	263 _{dez} (26.3 min^{-1})
	No motor: Data invalid	0
	No motor: Data invalid	0
	No motor: Data invalid	0

Line Speed Value for Motor 1-n (Key-to-line Mode)

Line speed value for motor 1-n consists of additional values in the transmission data block. They need not be set by the master. This data is required only for motors working in key-to-line mode.

The range of values extends from 1.0 to 100.0 %, and the transmission data must always be multiplied by a factor of 10 for transmission.

Line speed value for motor 1-n set to "0.0" (zero) is interpreted as *No speed setpoint*.

NOTE: *Line speed value for motor 1-n* is processed by the Nordson melter for every transmission data block, regardless of what was entered by *Command*.

In key-to-line the pump speed is regulated by *Line speed value for motor 1-n*. Every motor works with its own line speed signal.

The parameters *Line speed for min./max. pump speed* and *Min. / Max. pump speed* apply to every motor.

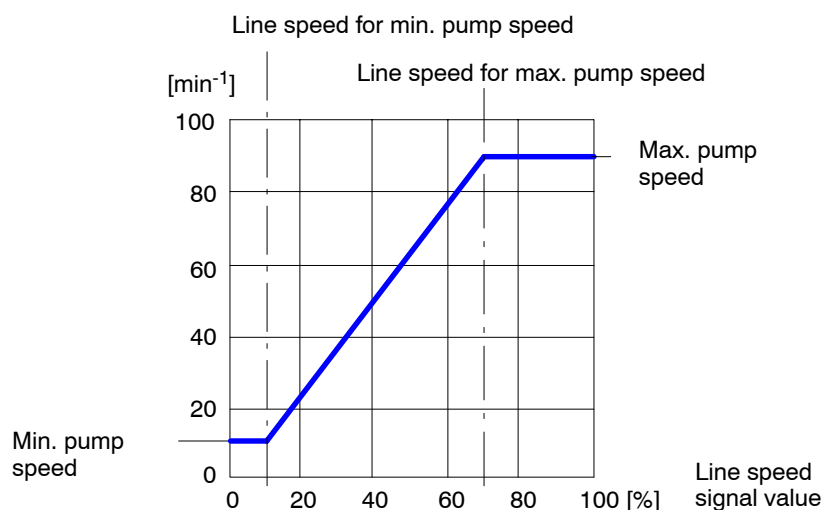


Fig. B-1 Example

Example of Startup with Standard Index Protocol

For indexes and bit positions, refer to *Communication Data List*.

1. Set the main switch to I/ON.

NOTE: The control unit needs some time to boot after the melter is switched on. No data can be exchanged via the field bus during this time.

2. With Profibus: Set the field bus address on the control panel. Other field buses: Set the address on the gateway.
3. Select control mode *Field bus* or *Dual* on the control panel.
4. Set the general melter data as well as limits and setpoints for all of the motors, temperature channels and pressure sensors.

Example

- a. Set *Heaters ON* (*Melter Control*, bit 0)
- b. Enable motors #1 and #2 (*Melter Control*, bit 2, bit 3)
- c. If the motors are to operate in key-to-line, set *Key-to-line mode* (for all motors) (*Melter Control*, bit 7)
- d. Set the temperature setpoint {115} for channel number 4 to 180 °C
- e. Set *Command* to 6 (The master wishes to write data to the Nordson melter)
- f. Set the line speed signal for motor #1 to 20.4 min⁻¹ and for motor #2 to 32.6 min⁻¹.

Transmission data block:

Melter control								Command	Data index	Channel number	Write data value	Line speed value for motor			
Bit Position												1	2	3	4
7	6	5	4	3	2	1	0								
1	0	0	0	1	1	0	1	6	115	4	180	204	326	...	...

Bit 0 *Heaters ON/OFF* is edge-controlled. To switch on, 0 → 1 (rising edge)

Bit 7 *Key-to-line* is edge-controlled. To switch on, 0 → 1 (rising edge)

- Check the *Acknowledge data* of the receive data block (replay from the Nordson melter): If the *Acknowledge data* is identical to the transmitted data index and the channel number, the job (*Command* = 6) is completed.

Example of Startup with Standard Index Protocol *(contd.)*

5. When the system is ready for operation, start the motors.

To do this, check the *Status* of the receive data block, e.g. by cyclically retrieving bit 0 *System ready*.

When the system is ready for operation (All temperature channels are heated, no errors), all motors that were previously enabled can be started with bit 1 *All motors ON (collective enable)* in *Melter control*.

Transmission data block:

Melter control Bit Position								Command	Data index	Channel number	Write data value	Line speed value for motor			
7	6	5	4	3	2	1	0					1	2	3	4
1	0	0	0	1	1	1	1	6	115	4	180	204	326	...	...

Communication Data List

General Information

- ACM = Auxiliary Control Module (Option). Additional electrical cabinet that control pump stations, for example.
- Transmission data with decimal places must be multiplied by the factor 10. Received data with decimal places must be divided by the factor 10.

Because of the two decimal places, the following applies to data index {65}: $\times 100$ or $\div 100$.

- ¹⁾ [R]: All data with *R(ead)* can only be read by the master. Writing is not permitted.

Data index 1)	Data designation	Channel number	Setting range, resolution	
Melter				
1 [R]	Manufacturer	0	"Nordson"	–
2 [R]	Software version IPC and HMI	0	"1.000" – "9.999"	–
3 [R]	Recipe version	0	"00.00" – "99.99"	–
4 [R]	Melter control mode 0: Standard 1: Field bus 2: Dual	0	0 – 2	0
5 [R]	Counter: Total hours with heaters on	0	0 – 32767 h	–
6	Service interval Definable time for signaling a certain service task	0	1 – 8736 h (1 year)	500
7	Reset service symbol 0: No reset 1: Reset Time for service interval is reset to "0"	0	0 / 1	0
8	Reserved			
9	System ready delay time	0	0 – 60 min	0

Data index	Data designation	Channel number	Setting range, resolution	
Melter				
10 [R]	Melter status 0: <i>Reserved</i> 1: Heatup phase 2: Startup protection 3: System ready 4: Motor running 5: Warning 6: Fault 7: Shutdown 8: Standby 9: Heaters off 10: <i>Reserved</i> 11: Motor circuit switch open 12: <i>Reserved</i> 13: Pressure buildup completed	0	0 – 13	–
11-14	<i>Reserved</i>			

Data index	Data designation	Channel number	Setting range, resolution	
Melter				
15 [R]	Melter status and alarms Bit 0 Value: 1 Alarm: Main contactor, tank thermostat failure (shutdown) 0 No alarm Bit 1 Value: 1 Command from field bus master missing (fault) 0 No alarm Bit 2 Reserved Bit 3 Value: 1 Service interval expired Warning that the user should perform a certain service task. 0 Service interval is not expired Bit 4 Reserved Bit 5 Reserved Bit 6 <i>Refer to Level</i> Bit 7 <i>Refer to Inert gas</i> Bit 8 Reserved Bit 9–13 <i>Refer to Level</i> Bit 14 <i>Refer to Pressure</i> Bit 15 <i>Refer to Motor</i>	0	Bit field	–
16 - 23	Reserved			

Data index	Data designation	Channel number	Setting range, resolution	
Motor				
15 [R]	Melter status and alarms (<i>Also refer to melter</i>) Bit 15 Value: 1 Motor circuit switch open 0 Motor circuit switch closed	0	Bit field	–
25	General control data Bit 0 Reserved Bit 1 Reserved Bit 2 Reserved Bit 3 Reserved Bit 4 Value: 1 Line started * 0 Line stopped * * Applies to the features pressure build-up and flow control, variation 1 (box:14, code:T) in the standard index protocol. In the extended index protocol, via <i>Melter control 1</i> . Bit 5 Reserved Bit 6 Reserved Bit 7 Reserved Bit 8 Reserved Bit 9 Value: 1 Enable flow control mode (for all motors) 0 Do not enable flow control mode Bit 10–15 Reserved	0	Bit field	–
30 [R] [R]	Motor mode 0: Speed control 1: Pressure control 10: Pressure build-up feature 11: Flow control	1 – 14	0 – 11	0
31	Switch motor to manual mode / key-to-line 0: Manual mode 1: Key-to-line	1 – 14	0 / 1	0
32	Speed setpoint, in manual mode	1 – 14	1.0 – 100.0 min ⁻¹	5.0
33	Key-to-line Line speed for max. pump speed (index 34) or for max. pressure (index 80).	1 – 14	0.0 – 100.0 %	100.0
34	Key-to-line Max. speed	1 – 14	1.0 – 100.0 min ⁻¹	80.0
35	Key-to-line Min. speed	1 – 14	0.0 – 100.0 min ⁻¹	0.0
36 [R]	Actual speed	1 – 14	0.0 – 100.0 min ⁻¹	–

Data index	Data designation	Channel number	Setting range, resolution	
Motor				
37	Motor OFF delay	1 – 14	0 – 30 s	0
38 [R]	Status: Motor OFF delay 0: Motor OFF delay not operating 1: Motor OFF delay operating	1 – 14	0 / 1	–
39	Key-to-line Line speed for min. pump speed (index 35) or for min. pressure (index 81).	1 – 14	0.0 – 100.0 %	0.0
40-42	<i>Reserved</i>			
43	Activate/deactivate threshold switch 0: Deactivate 1: Activate	1 – 14	0 / 1	0
44	Upper threshold value	1 – 14	1.0 – 100.0 %	10.0
45	Lower threshold value	1 – 14	1.0 – 100.0 %	5.0
46	<i>Reserved</i>			
47 [R]	Motor status and alarms Bit 0 Value: 1 Motor running 0 Motor not running Bit 1 Value: 1 Alarm: Motor coupling blocked or phase missing (shutdown) 0 No alarm Bit 2 Reserved Bit 3 Value: 1 Alarm: Motor or motor controller has overtemperature (fault) 0 No alarm Bit 4 Reserved Bit 5 Reserved Bit 6 Reserved Bit 7 Reserved Bit 8 Reserved	1 – 14	Bit field	–

Data index	Data designation	Channel number	Setting range, resolution	
Motor				
48	<i>Reserved</i>			
49	Flow control Pump speed when parent machine is stopped	1 – 14	1.0 – 100.0 min ⁻¹	5.0
50-59	<i>Reserved</i>			
Pressure				
15 [R]	Melter status and alarms (<i>Also refer to melter</i>) Bit 14 Value: 1 Pressure buildup completed 0 Pressure build-up not completed	0	Bit field	–
60	Pressure unit for all values 0: bar 1: psi	0	0 – 1	0
61 [R]	Actual pressure value (pressure sensor A)	1 – 16	0 – 100 bar (0 – 1450 psi) (0 – 10000 kPa)	–
62 [R]	Actual pressure value (pressure sensor B)	1 – 16	0 – 100 bar (0 – 1450 psi) (0 – 10000 kPa)	–
63 [R]	Actual pressure value (pressure sensor C)	1 – 16	0 – 100 bar (0 – 1450 psi) (0 – 10000 kPa)	–
64	Pressure setpoint (only pressure sensor A)	1 – 16	1 – 80 % of pressure measuring range end value	5
65	PID pressure control parameter Xp (gain P)	1 – 16	0.00 – 300.00	0.80
66	PID pressure control parameter Ti (integral action time I)	1 – 16	10 – 65000 ms	600
67	PID pressure control parameter Kd (differential portion D)	1 – 16	0.0 – 5.0	0.0
68	<i>Reserved</i>			
69	Activate/deactivate pressure alarm monitoring 0: Deactivate 1: Activate	0	0 / 1	0

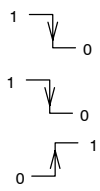
Data index	Data designation	Channel number	Setting range, resolution	
Pressure				
70	Value for underpressure warning (pressure sensor A)	1 – 16	<i>Speed control:</i> 0 –100 % of pressure measuring range end value <i>Pressure control:</i> 2 –30 % of pressure measuring range end value	0 bar
71	Value for underpressure warning (pressure sensor B)	1 – 16	<i>Speed control:</i> 0 –100 % of pressure measuring range end value <i>Pressure control:</i> 2 –30 % of pressure measuring range end value	0 bar
72	Value for underpressure warning (pressure sensor C)	1 – 16	0 –100 % of pressure measuring range end value	0 bar
NOTE: The value for the overpressure warning can not be greater than the value for the overpressure fault.				
73	Value for overpressure warning (pressure sensor A)	1 – 16	<i>Speed control:</i> 0 –100 % of pressure measuring range end value <i>Pressure control:</i> 2 –30 % of pressure measuring range end value	10 bar
74	Value for overpressure warning (pressure sensor B)	1 – 16	<i>Speed control:</i> 0 –100 % of pressure measuring range end value <i>Pressure control:</i> 2 –30 % of pressure measuring range end value	10 bar
75	Value for overpressure warning (pressure sensor C)	1 – 16	0 –100 % of pressure measuring range end value	10 bar

Data index	Data designation	Channel number	Setting range, resolution	
Pressure				
NOTE: Only with <i>Speed control</i> : The value for the overpressure warning/fault can not be less than the value for the underpressure warning.				
76	Value for overpressure fault (pressure sensor A)	1 – 16	<i>Speed control:</i> 0 –100 % of pressure measuring range end value <i>Pressure control:</i> 2 –30 % of pressure measuring range end value	15 bar
77	Value for overpressure fault (pressure sensor B)	1 – 16	<i>Speed control:</i> 0 –100 % of pressure measuring range end value <i>Pressure control:</i> 2 –30 % of pressure measuring range end value	15 bar
78	Value for overpressure fault (pressure sensor C)	1 – 16	0 –100 % of pressure measuring range end value	15 bar

Data index	Data designation	Channel number	Setting range, resolution	
Pressure				
79 [R]	Pressure status and alarms Bit 0 Value: 1 Alarm: Pressure sensor A, underpressure warning 0 No alarm Bit 1 Value: 1 Alarm: Pressure sensor A, overpressure warning 0 No alarm Bit 2 Value: 1 Alarm: Pressure sensor A, overpressure fault 0 No alarm Bit 3 Value: 1 Alarm: Pressure sensor B, underpressure warning 0 No alarm Bit 4 Value: 1 Alarm: Pressure sensor B, overpressure warning 0 No alarm Bit 5 Value: 1 Alarm: Pressure sensor B, overpressure fault 0 No alarm Bit 6 Value: 1 Alarm: Pressure sensor C, underpressure warning 0 No alarm Bit 7 Value: 1 Alarm: Pressure sensor C, overpressure warning 0 No alarm Bit 8 Value: 1 Alarm: Pressure sensor C, overpressure fault 0 No alarm Bit 9–15 <i>Reserved</i>	1 – 16	Bit field	–
80	Key-to-line mode (max. pressure)	1 – 16	1 –80 % of pressure measuring range end value	80 %
81	Key-to-line mode (min. pressure)	1 – 16	1 –80 % of pressure measuring range end value	0 bar

Data index	Data designation	Channel number	Setting range, resolution	
Pressure				
82	Motor control data	1	Bit field	–
	Bit 0 Value: 1 Pressure build-up feature motor 1 enabled			
	0 Pressure build-up feature motor 1 not enabled			0
	Bit 1 1 Pressure build-up feature motor 2 enabled			
	0 Pressure build-up feature motor 2 not enabled			0
	Bit 2 1 Pressure build-up feature motor 3 enabled			
	0 Pressure build-up feature motor 3 not enabled			0
	Bit 3 1 Pressure build-up feature motor 4 enabled			
	0 Pressure build-up feature motor 4 not enabled			0
	Bit 4 1 Pressure build-up feature motor 5 enabled			
	0 Pressure build-up feature motor 5 not enabled			0
	Bit 5 1 Pressure build-up feature motor 6 enabled			
	0 Pressure build-up feature motor 6 not enabled			0
	Bit 6 1 Pressure build-up feature motor 7 enabled			
	0 Pressure build-up feature motor 7 not enabled			0
	Bit 7 1 Pressure build-up feature motor 8 enabled			
	0 Pressure build-up feature motor 8 not enabled			0
	Bit 8 1 Pressure build-up feature motor 9 enabled			
	0 Pressure build-up feature motor 9 not enabled			0
	Bit 9 1 Pressure build-up feature motor 10 enabled			
	0 Pressure build-up feature motor 10 not enabled			0
	Bit 10 1 Pressure build-up feature motor 11 enabled			
	0 Pressure build-up feature motor 11 not enabled			0

Data index	Data designation	Channel number	Setting range, resolution	
Pressure				
82	Motor control data	1	Bit field	–
	Bit 11	1 Pressure build-up feature motor 12 enabled 0 Pressure build-up feature motor 12 not enabled		0
	Bit 12	1 Pressure build-up feature motor 13 enabled 0 Pressure build-up feature motor 13 not enabled		0
	Bit 13	1 Pressure build-up feature motor 14 enabled 0 Pressure build-up feature motor 14 not enabled		0
	Bit 14	1 Pressure build-up feature motor 15 enabled 0 Pressure build-up feature motor 15 not enabled		0
	Bit 15	1 Pressure build-up feature motor 16 enabled 0 Pressure build-up feature motor 16 not enabled		0
83	Pressure build-up feature Line speed value for activating pressure build-up	1 – 16	0 – 95 %	10 %
84	Pressure build-up feature <i>Setpoint for pressure build-up (only sensor A)</i>	1 – 16	1 – 70 % of pressure measuring range end value	10 %

Data index	Data designation	Channel number	Setting range, resolution	
Temperature				
110	Temperature unit 0: °Celsius 1: °Fahrenheit	0	0 / 1	0
111 ¹⁾	Activate/deactivate temperature channel 0: Deactivate 1: Activate	3 – 54	0 / 1	0
112	Switch application group*) *) <i>Standby</i> or <i>Deactivate</i> is dependent on the function selected on the control panel. Falling edge: Switch application group to standby or Falling edge: Deactivate application group Rising edge: Switch application group to control mode	1 – 8	0 / 1 	0
113 ²⁾	Temperature channel control mode / display mode 0: Control mode 1: Display mode	3 – 54	0 / 1	0
114 [R]	Status: Temperature channel 0: Switched off 1: Deactivated 2: Display mode 3: Control mode 4: Standby	1 – 54	0 – 4	–
115	Temperature setpoint *) Grid and reservoir: 175 °C Hose1 and gun1: 175 °C (deactivated) All other channels: 40 °C (deactivated)	1 – 54	<i>Min:</i> 40 °C (100 °F) <i>Max. standard:</i> 230 °C (450 °F) <i>Max HT:</i> 250 °C (480 °F)	*)
¹⁾ NOTE on data index 111: A channel that is part of a group can not be activated/deactivated with this index. ²⁾ NOTE on data index 113: A channel that is part of a group can not be switched from control mode to display mode.				

Data index	Data designation	Channel number	Setting range, resolution	
Temperature				
116-119	<i>Reserved</i>			
120 [R]	Actual temperature	1 – 54	–10 – 250 °C (32 – 480 °F)	–
121	<i>Reserved</i>			
122	PID pressure control parameter Xp (gain P)	1 – 16	0.00 – 300.00	0.80
123	PID pressure control parameter Ti (integral action time I)	1 – 16	10 – 65000 ms	600
124	PID pressure control parameter Kd (differential portion D)	1 – 16	0.0 – 5.0	0.0
125 – 126	<i>Reserved</i>			
127	Standby value NOTE: Differential value	1 – 54	5 °C – 190 °C (10 °F – 350 °F)	50 °C
128-131	<i>Reserved</i>			
132	Enable / do not enable manual standby duration 0: Not enabled 1: Enabled	0	0 / 1	0
133	Manual standby duration	0	1 – 1440 min (24h)	60
134	Enable / do not enable automatic enter standby after motor stop 0: Not enabled 1: Enabled	0	0 / 1	0
135	Automatic enter standby after motor stop	0	1 – 1440 min (24h)	60
136	Value for undertemperature warning The value for the undertemperature warning can not be greater than the value for the undertemperature fault.	1 – 54	5 °C – 30 °C (10 °F – 55 °F)	5 °C
137-140	<i>Reserved</i>			
141	Value for undertemperature fault Absolute temperature ≥ 35 °C (90 °F)	1 – 54	5 °C – 60 °C (10 °F – 110 °F)	10 °C
142-145	<i>Reserved</i>			

Data index	Data designation	Channel number	Setting range, resolution	
Temperature				
146	Value for overtemperature warning The value for the overtemperature warning can not be greater than the value for the overtemperature fault. <i>Standard:</i> Absolute temperature $\leq 235\text{ }^{\circ}\text{C}$ (455 $^{\circ}\text{F}$) <i>HT:</i> Absolute temperature $\leq 255\text{ }^{\circ}\text{C}$ (490 $^{\circ}\text{F}$)	1 – 54	5 $^{\circ}\text{C}$ – 30 $^{\circ}\text{C}$ (10 $^{\circ}\text{F}$ – 55 $^{\circ}\text{F}$)	5 $^{\circ}\text{C}$
147-150	<i>Reserved</i>			
151	Value for overtemperature fault <i>Standard:</i> Absolute temperature $\leq 245\text{ }^{\circ}\text{C}$ (475 $^{\circ}\text{F}$) <i>HT:</i> Absolute temperature $\leq 265\text{ }^{\circ}\text{C}$ (510 $^{\circ}\text{F}$)	1 – 54	5 $^{\circ}\text{C}$ – 60 $^{\circ}\text{C}$ (10 $^{\circ}\text{F}$ – 110 $^{\circ}\text{F}$)	10 $^{\circ}\text{C}$
152-155	<i>Reserved</i>			
156 [R]	Value for overtemperature shutdown	1 – 54	Refer to value for overtemperature fault +10 $^{\circ}\text{C}$ (20 $^{\circ}\text{F}$)	
157 [R]	Temperature status and alarms Bit 0 Value: 1 Heater switched on 0 Heater switched off Bit 1 Value: 1 Alarm: Undertemperature warning 0 No alarm Bit 2 Value: 1 Alarm: Undertemperature fault 0 No alarm Bit 3 Value: 1 Alarm: Overtemperature warning 0 No alarm Bit 4 Value: 1 Alarm: Overtemperature fault 0 No alarm Bit 5 Value: 1 Alarm: Overtemperature shutdown 0 No alarm Bit 6 Value: 1 Alarm: Sensor short-circuit (fault) 0 No alarm Bit 7 Value: 1 Alarm: Sensor input open or sensor broken (fault) 0 No alarm	1 – 54	Bit field	–
158	Regulation ratio The regulation ratio indicates the percentage of a time interval during which the heater output is on. Duration of measurement is 1000 ms Example: 82 % = 820 ms on and 180 ms off	1 – 54	0 – 100 %	–
159-169	<i>Reserved</i>			

Data index	Data designation	Channel number	Setting range, resolution	
Inert gas				
15 [R]	Melter status and alarms (<i>Also refer to melter</i>) Bit 7 Value: 1 Status: Inert gas injection 0 Status: No inert gas injection	0	Bit field	–
170	Switching on/off inert gas injection (manual) 0: Switching off 1: Switching on	0	0 / 1	0
171	Gas on duration	0	2 – 120 s	5
172	Gas off duration	0	2 – 120 min	30
173	Reserved			
174	Reserved			
Level				
	Index 15 Bit 6 and 13 only with 5-point sensor (fixed measuring points) Index 190 to 193 only with analog level sensor (variable measuring points)			
15	Melter status and alarms (<i>Also refer to melter</i>) Bit 6 Reserved Bit 9 Value: 1 Status: Tank is being filled 0 Status: Tank is not being filled Bit 10 Value: 1 Alarm: Tank overfilled (warning) 0 No alarm Bit 11 Value: 1 Alarm: Tank level is low (warning) 0 No alarm Bit 12 Value: 1 Alarm: Tank empty (fault) 0 No alarm Bit 13 Reserved	0	Bit field	–
190 [R]	Actual level	0	0 – 100 %	–
191	Start (filling) at	0	5 – 98 %	10
192	Stop (filling) at	0	5 – 98 %	80
193	Warning Tank level low	0	5 – 90 %	10

Data index	Data designation	Channel number	Setting range, resolution	
Level				
194	Activate/deactivate level control 0: Deactivate Now the tank can be emptied for maintenance or repair work without the fault <i>Tank empty</i> occurring. 1: Activate	0	0 / 1	1
Seven-day clock				
200	Activate/deactivate seven-day clock 0: Deactivate 1: Activate	0	0 / 1	0